IDG .com

RESPECTING PRIVACY Experts expect Congress to pass an online privacy law in 2001. Page 12.

MAKING ETHERNET MORE FLEXIBLE That's the key for metropolitan network service provider Yipes, says CEO Jerry Parrick. Page 33.

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NetworkWorld

December 4, 2000 Volume 17, Number 49

The network portal: www.nwfusion.com

E-comm explosion

Microsoft, IBM and iPlanet ready major upgrades of their e-comm software.

PAGE 10

WHICH IS THE BEST streaming media service provider for your corporate communications? Check out our exclusive "race" results. **PAGE 64.**

EMC box called NetApp killer

Net-attached storage system to debut this week.

BY DENI CONNOR

HOPKINTON, MASS. — EMC this week will try to shake up the network-attached storage market with a fault-tolerant device aimed at customers flocking to high-flying Network Appliance for its fast, relatively inexpensive storage appliances.

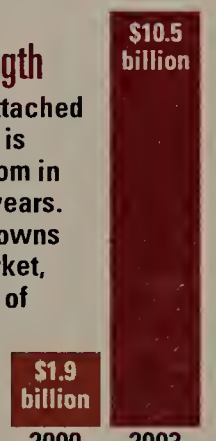
The EMC ip4700, code-named Chameleon, is a 3.6-terabyte NAS box for enterprise and service provider networks that some observers say could be a Network Appliance killer. Like the 4.5-terabyte NetApp F840 appliance and two-node F840 cluster, EMC's product will likely be used for file and print services, possibly replacing NetWare or Windows NT servers.

Network Appliance, which pulls in less than one-tenth the annual revenue of EMC, accounts for nearly half of all

See **EMC**, page 98

Storage strength

The network-attached storage market is expected to boom in the next three years. EMC currently owns 29% of that market, thanks to sales of its Celerra devices.



SOURCE: IDC

Cisco firewall review: Screaming throughput

BY JOEL SNYDER, NETWORK WORLD GLOBAL TEST ALLIANCE

Cisco this week will enter the rarified air of gigabit speed security when it unveils the Cisco Secure PIX Firewall 535.

And not a moment too soon — with multiple OC-3 (155M bit/sec) links becoming commonplace at service providers and large corporations, a gigabit firewall is no longer a steroid-induced fantasy.

The Network World Global Test Alliance got an exclusive chance to test the performance of this gear and found that the newest member of the PIX Firewall line outguns the rest we've seen. How fast? How does 2G bit/sec grab you?

Keep in mind that the PIX 535 is just another member of the PIX family. Although it has more interfaces and faster throughput, everything else about it will be familiar to

See **Cisco**, page 96

Users take their time on Win 2000

BY JOHN FONTANA

REDMOND, WASH. — Nearly 10 months after its release, Windows 2000 is being outsold nearly 2 to 1 by predecessor Windows NT, a strong indication that companies are taking a cautious approach to migration.

Significantly, the bulk of those Win 2000 sales are not on the server side, which means companies are not rushing into network infrastructure

See **Windows 2000**, page 14

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Win 2000 migration advice.

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DocFinder: 2043

Excite@Home with ASPs

BY DENISE PAPPALARDO

VOICES OF ASP EXPERIENCE

Second in a three-part series

Corralling acquired companies onto a common IT infrastructure is an age-old challenge traditionally tackled by in-house staff. Today, some network executives are turning to application service providers for help.

The lessons learned by one such company — including the critical issue of application customization — is the subject of this second of a three-part series profiling

See **ASP**, page 100

CINDY CHARLES/MPG

Excite@Home's Mary Ruiz is using ASPs to reduce risk.

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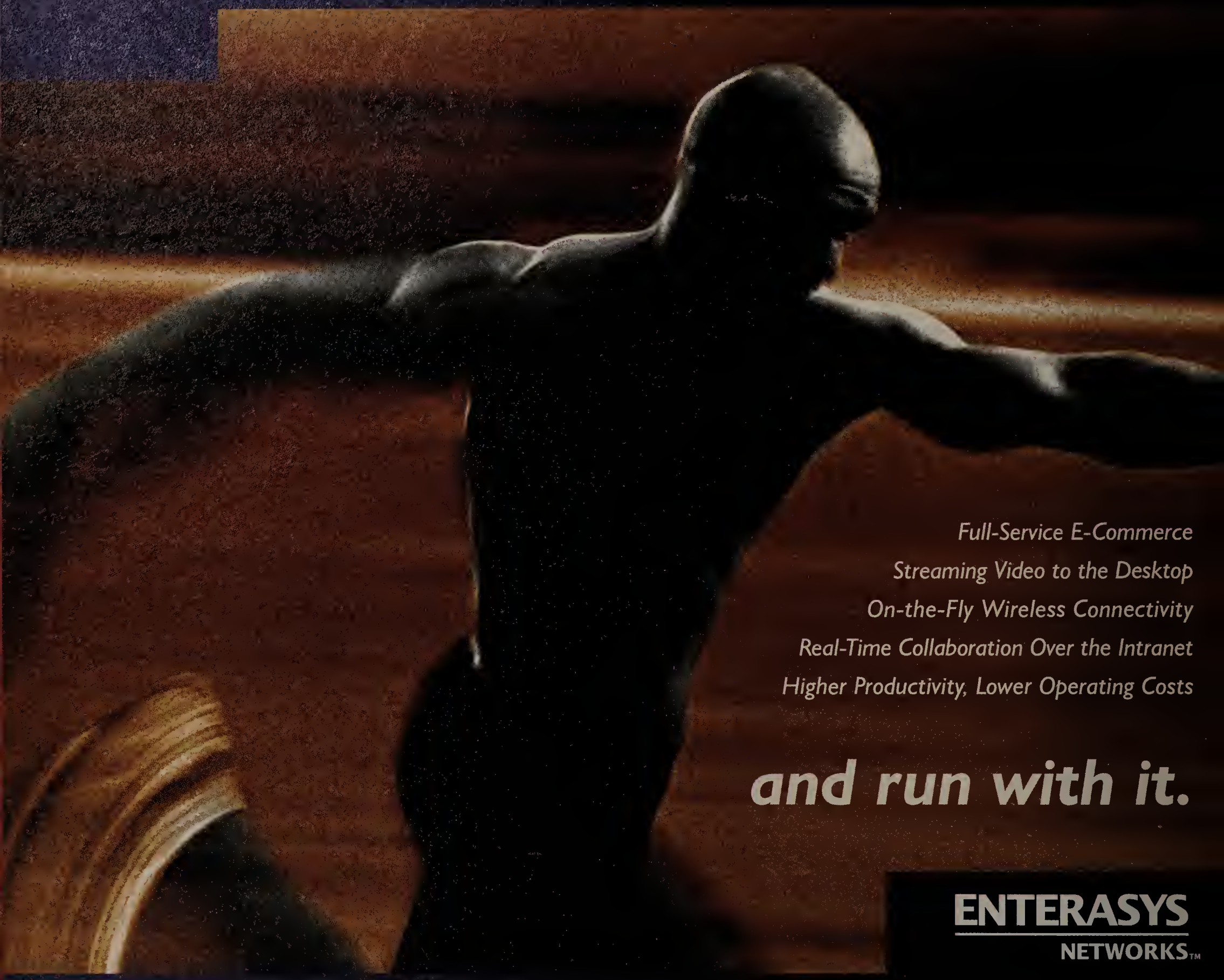

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DECEMBER 4, 2000

8 Experts discuss problems surrounding B2B exchanges.

10 Microsoft, iPlanet and **IBM** readying upgrades of e-commerce software.

10 Business Internet Consortium to address key e-biz problems.

10 XML-based encryption scheme touted.

12 Novell software boosts e-commerce.

12 No matter who is president, an **online privacy law** is likely.

13 Access control software gets policy management boost.

14 Microsoft blasts judge.

15 Talk2 touts service for carriers that voice-enables corporate data access.

17 Cisco pumps up voice-over-IP product family.

98 Verizon leaves NorthPoint at the altar.

100 DSL provider Covad plans to cut 400 jobs.

FTC Chairman Pitofsky wants 'Net privacy protection.

Page 12

Judge Jackson preparing for Microsoft rebuttal.

Page 14

Infrastructure

21 Hewlett-Packard debuts new entry-level Unix server.

24 Allied Telesyn to roll out Layer 3 wares.

24 Genesys adds voice over IP to its call center suite.

26 Entrada unveils multifaceted IP storage router.

27 Dave Kearns: Microsoft hasn't learned courtroom humility.

SPECIAL FOCUS: NOVELL'S TURNAROUND? *The jury remains out on Novell's One Net strategy.* **Page 30.**

Carriers & ISPs

33 AT&T Broadband temporarily stops taking delivery equipment from equipment vendors.

38 David Rohde: The myth of one-stop shopping.

The Edge

41 Enterprise demand may prop up **service provider investments.**

41 Cost-effective trunking helps rural telco buy into DSL.

44 General Bandwidth woos RBOCs.

Enterprise Applications

47 Motive eases online customer service.

47 Novadigm software targets mobile user management.

50 RecoverySafe helps heal ailing Windows systems.

50 Corio service to tackle legacy applications management.

56 Scott Bradner: The importance of getting lost.

Technology Update

59 Storage over the Internet — iSCSI emerges.

60 Gearhead: Looking out for scans.

Yipes CEO Jerry Parrick on flexible bandwidth.

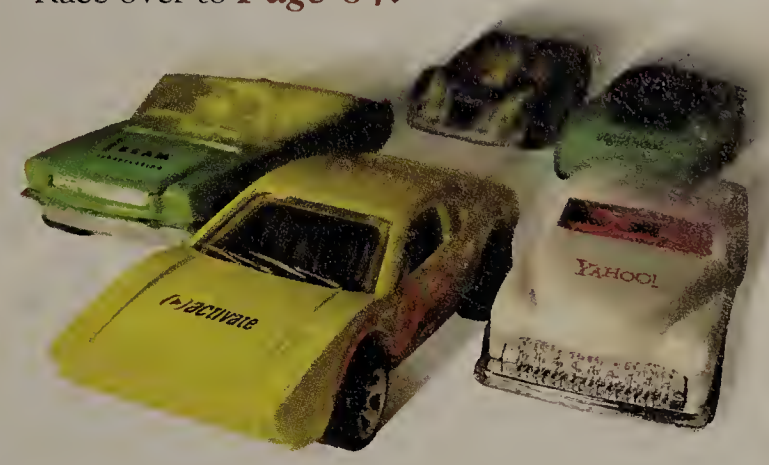
Page 33

Dene' Bettmeng on IT management.

Page 79

Review:

Which is the best streaming media service provider for your company? Race over to **Page 64.**



Feature:

A new breed of carrier-class Gigabit Ethernet switches is paving the way for IP-based metropolitan-area networks. **Page 75.**

The Edge Feature

Management

Lessons learned: An IT executive looks back on her 27-year career and shares what she would have done differently. **Page 79.**

Editorial: Facts and figures about our wired nation. **Page 62.**

Daniel Briere and Beth Gage: More names we love to hate and hate to love. **Page 63.**

Winn Schwartau: Honeypots wreak sweet revenge against cyber intruders. **Page 63.**

Backspin: Hacking the cuteness out of Furby. **Page 102.**

'Net Buzz: Start-up looks to let the uninitiated in on Web auction game. **Page 102.**

Net Know-It-All.....Page 8

Ask Dr. Intranet.....Page 59

Message Queue.....Page 62

Editorial and advertiser indexes.....Page 94

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INTERACTIVE

Forum: Verizon DSL service

A few readers have happy Verizon stories. Others, however, blast the company. "I have dedicated myself to the destruction of Verizon," one person writes. What about you? **DocFinder: 2044**

Forum: SBC/Ameritech service

It's a similar case over in our SBC forum, where most respondents express displeasure with the company's service. Ameritech responds. **DocFinder: 2045**

Forum: Remote Node

It's the forum for our new Net.Worker section. Use it to post and answer tough remote office and small office/home office questions or talk about the perils and joys of working at home (or managing people who do). **DocFinder: 2046**

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The best of the NetFlash daily newsletter

IBM appoints its first chief privacy officer

In what could be just the beginning of a big trend, IBM last week named Harriet Pearson as the company's first chief privacy officer. The idea is that Pearson, a 10-year public policy veteran, will steer IBM's privacy principles and practices, as well as lead privacy initiatives across IBM's businesses, including those in research and development, marketing, sales and Web strategy. Hewlett-Packard also has a privacy czar and other firms are doing the same.

E-business "gives enterprises a powerful new capability to capture and analyze massive amounts of information . . . yet this very capability troubles some people, who see it as a means to disclose or exploit their personal information," IBM CEO Louis Gerstner says. But, he adds, "privacy is not a technology issue. It is a policy issue."

Well it's a little of both, but the notion that one person inside a corporation is responsible for privacy may be an idea who's time has come for many enterprise folks. **DocFinder: 2051**

Verizon leaves NorthPoint at the altar

Verizon last week terminated its merger agreement with DSL provider NorthPoint Communications, citing NorthPoint's deteriorating financial position and business operations as the primary causes. NorthPoint and Verizon announced on Aug. 7 that Verizon would purchase a 55% interest in NorthPoint, and the companies would merge their DSL operations. **DocFinder: 2052**

CA offers antivirus software for Palm devices

Software maker Computer Associates last week announced it has made a working production version of its antivirus software for the Palm OS handheld computer operating system available for free download. **DocFinder: 2053**

— Michael Cooney, associate news editor

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COLUMNISTS

Keeping Current

Take a lesson from Juno

Fred McClimans on how to deal with your bandwidth hogs. **DocFinder: 2047**

Home Base

Give up the kitchen table

Jeff Zbar explains how to equip your home office ergonomically. **DocFinder: 2048**

Compendium

Elizabeth Hurley on the Cisco 2600 Series

Fusion Executive Editor Adam Gaffin introduces you to RouterGod interviews, shows you the most Boring Web site on the planet and pities the poor PC technician. **DocFinder: 2049**

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NEWS BRIEFS, DECEMBER 4, 2000

CIA fires 'chatty' employees

After a seven-month internal CIA investigation into an unauthorized chat room that had been operated for more than a decade by a cadre of CIA employees and contractors, CIA management last week meted out punishment for what it called "a violation of trust." The CIA fired four employees, suspended about a dozen others and revoked the security clearances of nine private contractors for exchanging "inappropriate" e-mail in the chat room that had been hidden from official knowledge. Seventy-nine other employees with some involvement in the secret CIA chat room were slapped with letters of warning. Off-color e-mail wasn't the main reason for the punishment, the CIA asserts; rather, that the chat room's organizers deliberately deceived their superiors about it prompted the long investigation and punishments.

Ping author dies in car crash

Michael Muuss, author of the ubiquitous Ping network tool, was killed two weeks ago in an automobile accident near his Maryland home. Muuss, 42, wrote Ping in only one evening and was fond of saying he would have spent more time on it had he envisioned its future importance. At first a Unix-only diagnostic program, the tool is now part of almost every operating system. Muuss worked at the U.S. Army Research Laboratory at Aberdeen Proving Ground, where he did groundbreaking work in areas ranging from computer networks to graphics.

AT&T names Dorman president

AT&T named David Dorman as the company's new president. The role was vacated more than a year ago when John Zeglis was named CEO of AT&T Wireless. Dorman is responsible for the firm's consumer and business service groups, international activities and AT&T Labs. AT&T CEO C. Michael Armstrong is focusing on the company's cable and wireless businesses, which will both be spun off by 2002. Dorman was most recently CEO of Concert — AT&T and British Telecom's international joint venture.

AT&T Wireless, NTT team up

AT&T Wireless and NTT are teaming up. The Japanese wireless service provider is taking a 16% stake in AT&T Wireless. The investment amounts to more than $9.8 billion. AT&T Wireless executives say the company will use much of the cash infusion to pay debts. But the arrangement also includes technology sharing. NTT says it will launch third-generation wireless network upgrades next year using the Wideband Code Division Multiple Access specification. AT&T Wireless says it also will use the same technology to upgrade its network, but will not have third-generation equipment deployed until 2002.

European cows can breath easier

The things European cows have to worry about these days. As if Mad Cow Disease weren't enough, some people have been ruminating that mobile phone signals could be driving cattle batty. It appears the concerns were overstated. A $357,000 study, ordered by the Bavarian state government and half funded by mobile operators, failed to prove that wireless phone transmissions harm cattle. The results were based on a field study conducted by German scientists on 38 farms in Bavaria and Hesse, half of them in the proximity of mobile network antennas. Scientists observed changes in "cud-chewing behavior" in some herds near the antennas, but there was no solid cause-and-effect relationship. Otherwise, there was no conclusive evidence on health effects.

Tool on tap for wireless LANs

Sniffer Technologies, a Network Associates business, is expected to announce this week a protocol analyzer for Cisco wireless LANs. Sniffer Wireless will let users of Cisco's Aironet wireless LAN spot security risks and encryption issues in real time, and identify potential network problems, Sniffer says. Pricing and availability was unavailable at press time.

PictureTel sheds MultiLink unit

Struggling to regain a foothold in the videoconferencing market, PictureTel last week sold its MultiLink audio business to Spectel of Ireland. The deal calls for PictureTel of Andover, Mass., to be paid $26 million in cash and up to $4 million in Spectel stock, depending on MultiLink's revenue for 2000. PictureTel originally purchased MultiLink in 1997 for $40 million, but the firm had trouble integrating its many lines of business.

Reynolds and Reynolds buys ASP for automotive industry

The Reynolds and Reynolds Company last week shelled out $12 million to purchase DealerKid, an application service provider of customer relationship management (CRM) software and services to the automotive industry. Reynolds CEO Buzz Waterhouse says the acquisition of DealerKid will be a core offering for its auto industry CRM professional services.

B2B exchanges suffering from growing pains

Exchanges need to work better with legacy apps.

BY KATHLEEN OHLSON

ROSEMONT, ILL. — Business-to-business online marketplaces will shake off their growing pains, but only after overcoming two problems: legacy-system integration issues and old-school attitudes about brand and information control.

That's a rough consensus of vendors, customers and industry watchers who attended last week's SupplyWeb-Exchange 2000 conference.

"The bugaboo [for business-to-business marketplaces] right now is legacy systems," says John Fontanella, an analyst at AMR Research. Participating businesses want packaged software to automatically connect their legacy systems to exchanges, but the technology isn't ready yet, he says, meaning the exchanges may not come into their own for years.

Part of the problem stems from a lack of standards for marketplace members exchanging information about shipping and tracking products, receiving orders and applying security tags on information within the exchange, all of which were griped about during the conference.

B2B exchange bonanza?

Gartner Group predicts that the number of online marketplaces will increase from about 300 last year to about 3,000 by 2005.

General Motors, which is a member of auto exchange Covisint, expects to spend $20 million to link its legacy systems to the exchange, says Harold Kutner, group vice president at the auto maker. "It's the biggest problem and we need to be fast, but we can't do it fast" and still ensure there are no problems, he says. Covisint is expected to roll out for broad availability by the end of 2001.

No onramp

David Hutchings, director of e-commerce at Kraft Foods North America, says businesses are reluctant to enter into exchanges because "there's no onramp to the exchange, and the standards [available now] don't match legacy applications" such as supply chain and enterprise resource planning. But Fontanella says vendors such as IBM, Sun and Hewlett-Packard are offering consulting services in conjunction with hardware and selling those packages to companies as a way to ease them into the marketplaces.

Businesses also worry about losing brand differentiation, which is one reason industry exchanges won't make it, according to Charles Grantham, CEO for the Institute for the Study of Distributed Work, a Windsor, Calif., research program that focuses on the Internet workplace. Private exchanges will fare better, he says, because they will let businesses organize their back-end systems with each other, while keeping their branding unique.

The challenges facing

See **B2B**, page 13

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This week's question:

Openwave Systems is the new name of which two merged companies?

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Microsoft, iPlanet, IBM ready e-commerce wares

BY JOHN FONTANA

IT executives looking for software to create e-commerce Web sites will soon get an eyeful from some big-name vendors.

This month, Microsoft will ship its Commerce Server 2000, and iPlanet will unveil major upgrades and integration features to its six e-commerce applications. In January, IBM will ship Version 5.1 of its WebSphere Commerce Suite, which will finally make Java the centerpiece of the platform.

The upshot for enterprise users is that they will be able to evaluate e-commerce software more as an integrated whole and less as a stitched-together hodgepodge.

Microsoft, iPlanet and IBM offer sell-side applications that include catalog, search, customer-tracking, data-mining, profiling and development tools. IPlanet has additional applications for activities such as billing and trading.

"E-commerce software is starting to get more like ERP than the pieces and parts it has been in the past," says Mitch Kramer, an analyst with Patricia Seybold Group. "The functionality is much richer and broader, and there is the ability to integrate with external applications such as financial systems."

Microsoft this month will ship Commerce Server 2000, which replaces Site Server Commerce Edition. The server has been redesigned to host electronic storefronts, or so-called sell-side commerce.

The server, which runs only on Windows 2000, features a new product-catalog system, management tools and online analytical processing-based reporting tools. It also features a number of enhanced data-mining and profiling capabilities. A new feature called Business Desk allows Web site managers to review reports, create marketing campaigns, update product data, check order status and modify profiles.

"The server performs more of an application-level role than an infrastructure role," says Rebekkah Kumar, lead product manager for Commerce Server 2000.

Next week iPlanet will unveil upgrades to its e-commerce applications that will integrate them with the company's infrastructure servers, such as Directory Server and Application Server. The applications are BuyerXpert, SellerXpert, BillerXpert, ECXpert, TradingXpert and Market Maker. The company also will add new customization features across the product line and enhance support for XML.

Company officials are being coy about the announcement, but say it will include a platform strategy that will finally tie together the company's lineup of e-commerce products. The platform will run on Sun Solaris.

Not to be left behind, IBM will upgrade the Start, Pro, Developer and Professional editions of WebSphere Commerce Suite. IBM officials would not comment on the impending shipment of the software, but a product review

See **E-comm,** page 14

Industry heavyweights join to address key e-biz problems

BY APRIL JACOBS

More than 20 vendors banded together last week to form the Business Internet Consortium, which will try to address some tough problems enterprise users face in the e-commerce arena.

Members, including Computer Associates, Dell and Microsoft, say the goal is to provide a think tank for developing e-commerce technologies and best practices users can follow to make doing business over the Internet easier.

The consortium is considering forming workgroups that would address specific issues, such as how XML can be used to transform traditional business practices into e-business practices, and how users should integrate existing business systems with new e-business infrastructure. Other workgroups may address improving the exchange of e-business information over multiple devices, such as mobile phones to PCs.

The group is also looking for input from users. It already announced that two high-profile companies in the financial arena have joined the consortium — Capital One and Charles Schwab.

John Sommerfield, a spokesman for Schwab, says the company hopes the consortium will serve as a clearinghouse for e-commerce issues.

"We use technology to communicate to our customers," Sommerfield says.

"We have five call centers that handle between seven and eight million calls per month and a Web site that at peak load does $25 billion in securities transactions a week. What we are hoping is that this consortium allows us to communicate with our vendors and drive solutions for our customers," he adds.

With high-profile users and vendors involved, the consortium has credibility coming out of the starting gate, but its success is still uncertain. Observers say it will have to avoid pitfalls other consortia have faced, such as infighting between vendors and an inability to affect any real change. There is also a confusing plethora of consortia — including RosettaNet and the Universal Description, Discovery and Integration Project — all seemingly trying to solve e-commerce problems.

Still, Dwight Davis, an analyst with Summit Strategies, says he thinks this newest group is needed for several reasons.

"There is a lot of confusion out there about the deluge of technologies coming into the market and uncertainty about moving into Web-based computing," he says. "There is a need for some neutral body to guide companies along the way."

Business Internet Consortium: www.businessinternetconsortium.org

The Business Internet Consortium

Purpose:
A neutral, nonprofit corporation that will serve as a think tank for generating technologies and practices designed to address growing e-business issues.

Sampling of members:

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- Charles Schwab
- Commerce One
- Computer Associates
- Dell
- Fourthstage
- Fujitsu
- Hewlett-Packard
- IBM
- Intel
- Microsoft
- SAP
- Siemens
- Stratus
- Unisys
- Zefer

XML-BASED ENCRYPTION SCHEME TOUTED

VeriSign, Microsoft and WebMethods last week introduced a specification that works to simplify the integration of public-key infrastructure and digital certificates with XML applications.

The companies have released the specification, dubbed XML Key Management Specification (XKMS), and will submit it to the appropriate Web standards bodies for consideration as an open Internet standard, the companies say.

XKMS is designed to let users and developers integrate authentication, digital signature and encryption services — such as certificate processing and revocation status checking — in Web-based applications. This will let developers avoid the use of proprietary software tool kits from PKI software vendors.

The specification works with trust functions residing on servers, accessible via programmed XML transactions. XKMS is compatible with standards for Web Services Description Language and Simple Object Access Protocol.

Microsoft announced it will build XKMS into the company's .Net architecture for business-to-business and business-to-consumer environments.

The specification for XKMS and a white paper can be viewed at www.verisign.com/developer/xml/.

— James Evans is a correspondent with the IDG News Service's Boston bureau.

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Novell product promises safe, fast e-comm

Secure Accelerator works with company's Internet Caching System.

BY DENI CONNOR

PROVO, UTAH — Novell is expected to announce software for its Internet Caching System that the company says will help ensure the integrity and boost the speed of e-business transactions.

Secure Accelerator, formerly code-named SSLizer, speeds e-commerce transactions based on Secure Sockets Layer (SSL) by encrypting data, verifying the identity of the user and re-encrypting the data for delivery in real time. The software sits on an ICS 2.0 caching server between the client browser and the Web server and uses spare processor cycles on the ICS appliance to off-load SSL negotiations and data encryption from the Web server, freeing it to concentrate on the task of delivering Web pages.

Novell confirmed that Secure Accelerator will be sold as a software-only product that runs with ICS or as part of an accelerator card package marketed through a systems manufacturer. Secure Accelerator implemented as hardware and software would compete with adapters from Rainbox Technologies that are placed in caching products from CacheFlow and Network Engines or appliances or adapters from Phobos or Sun. The market for these products is exploding as more businesses become involved in e-commerce and require fast, secure transactions, according to market research firm IDC.

"By bolting an SSL accelerator onto a caching product, you can speed up cache response time considerably for already cached content," says John Humphreys, an analyst with IDC. "Those kinds of requests can be pushed to the caching product instead of having to rely on the Web server."

Brian Faustyn, a product manager for Novell, says Secure Accelerator could handle up to 200 connections per second. That corresponds to Phobos' SSLRack, which processes the same number of transactions per second. Novell says a Web server can establish 322 non-SSL connections per second, but when SSL is added that drops to 24 connections per second.

SSL is the predominant method for securing e-commerce transactions. HTTP transactions protected by SSL are known as secure HTTP. SSL creates an encrypted link between the client's browser and the Web server. The additional processing to encrypt this data and decrypt it causes as many as 25% of Web transactions to abort because of poor response time, the company claims.

"When you add SSL to a Web server, you add a pretty significant CPU bottleneck," says Brian Holman, chief information officer for WebMiles in Sandy, Utah.

"It's also cleaner to add the SSL acceleration to the caching box instead of setting up two instances of a Web server, one for non-SSL data and one for SSL data, which are administered separately," he adds.

WebMiles is an Internet company that gives consumers unrestricted miles redeemable for free travel.

IDC says the caching software and appliance market is just emerging. The research company estimates the caching market will be $400 million for 2000, increasing to more than $4 billion by 2004.

Secure Accelerator uses NDS eDirectory, the Lightweight Directory Access Protocol or a Remote Authentication Dial-In User Service server to validate certificates and authenticate users to the system. It supports all common Web server software from vendors such as Apache, Netscape and Microsoft. All of today's Internet browsers are also supported.

The product is expected to ship at the start of next year. Prices are not available.

Novell: www.novell.com

Battered by disappointing financial results, Novell has staked its comeback fortunes on a strategy called One Net. Is it working? The jury's out. See story, Page 30.

Experts expect U.S. online privacy law to pass soon

BY CAROLYN DUFFY MARSAN

WASHINGTON, D.C. — Despite uncertainty in the outcome of the presidential election, privacy advocates expect the next Congress to pass a law providing basic protections for consumer privacy online.

A general-purpose online privacy law would affect all Web sites run by U.S. companies and nonprofit organizations, and it could require significant investments in network security, database management and auditing systems, experts say.

"Whether Bush or Gore is elected makes very little difference on this issue," said Christine Varney, a former commissioner of the Federal Trade Commission (FTC) and a partner at Hogan & Hartson.

"The Internet will not evolve to its full potential unless privacy is protected."

Robert Pitofsky, chairman, FTC

"Privacy is high on the list of bipartisan bills with support in both houses," said Jerry Berman, executive director of the Center for Democracy and Technology. "There is a chance to do something that is both bipartisan and balanced."

Berman and Varney made their remarks at a conference on privacy and business held last week.

Privacy advocates expect Congress to pass an online privacy law that includes principles such as notice, choice, access and integrity. Notice means Web site operators must explicitly notify consumers about personal information being gathered and how that information is used. Choice means consumers can opt out of information collection. Access means consumers can see the information gathered about them and correct errors. Integrity means Web site operators must ensure that consumer information is protected from unauthorized use.

An online privacy law also would include enforcement mechanisms such as fines. The FTC wants to be the government agency that enforces a general-purpose online privacy law, as it does an existing law governing Web sites for children.

"The Internet will not evolve to its full potential unless privacy is protected," says Robert Pitofsky, chairman of the FTC. Pitofsky says 97% of U.S. Web sites collect personally identifiable information from con-

See **Privacy**, page 15

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Access control software gets policy mgmt. boost

Entegrity Solutions attempts to differentiate its new AssureAccess offering via flat-rate pricing model.

BY ELLEN MESSMER

SAN JOSE — Entegrity Solutions this week will start shipping software that lets companies control end-user access to Web and e-business application servers according to administer-defined policies, such as time of day, preferred customer or job responsibility.

Called AssureAccess, it's the first product from Entegrity to allow policy-based management, a capability that the company's earlier access-management server, AssureWeb, lacked.

Flat-rate advantage?

While competitors such as Netegrity, Securant, IBM and Entrust market policy-based Web servers, Entegrity will try to stand apart by offering a flat-rate pricing model of $45,000 for unlimited use, while competitors license on a per-usage basis. One early adopter, the business-to-business transportation services exchange Logistics.com, says the flat-rate pricing played a major role in its decision to go with Entegrity.

Flat-rate pricing could prove attractive in active business-to-business environments in which an unknown number of users may be given application access over time.

AssureAccess consists of Java-based agent software that typically resides behind the Internet firewall on Web or application servers to authenticate end users via password ID, Windows NT domain, X.509 certificate or custom-designed security interface. AssureAccess supports BEA Systems' WebLogic and Inprise's application servers.

AssureAccess not only authenticates and authorizes usage, but it also collects an audit trail of events and reports back to a central management server that's part of the product. The software can flag questionable user practices, such as someone trying to gain access at 3 a.m. when they're not allowed to do so according to predefined policies.

System administrators can choose to set up access policies on their own through a Web-based graphical interface or delegate authority to outside parties for managing a portion of the user base.

Like other Web access-control products, AssureAccess provides a single-sign-on capability so end users only have to authenticate once to gain access to multiple Web resources.

This was a key requirement for Logistics.com, the Burlington, Mass., online marketplace for purchasing air, land and sea transportation services, according to its chief technology officer, Ed Simmons.

Another reason Logistics.com selected AssureAccess is that the Web access-control server was designed from the ground up to work well with BEA's WebLogic Server, which Logistics.com already uses to process transactions between the Web and a back-end database.

Logistics.com stores the security policy and user information in its own Lightweight Directory Access Protocol directory, but AssureAccess comes bundled with a directory Entegrity calls SafePages.

Entegrity: www.entegrity.com

Entegrity's AssureAccess offering

The access-management software supports:

- Windows NT 4.0, Win 2000, Solaris 2.6 and 2.7, HP-UX 10.2 and 11.0.
- Microsoft IIS and Sun iPlanet Web servers.
- BEA WebLogic Server 5.1 and Inprise Application Server 4.1.
- Digital certificates from VeriSign, Entrust and Baltimore.

Security

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B2B,
continued from page 8

these exchanges are psychological as well as technological, according to the conference attendees.

"It's the 42-long jacket syndrome —white men wearing blue shirts," Grantham says. "Change scares the hell out of people."

That syndrome may have been evident at Dow Chemical. The senior management of the $19 billion chemical company initially delayed getting involved in online marketplaces, but that changed when competitors such as Enron, Shell Chemicals and British Petroleum formed their own private exchanges in the past two years. Dow joined Dupont and BASF in May to create Elemica, a chemical industry marketplace.

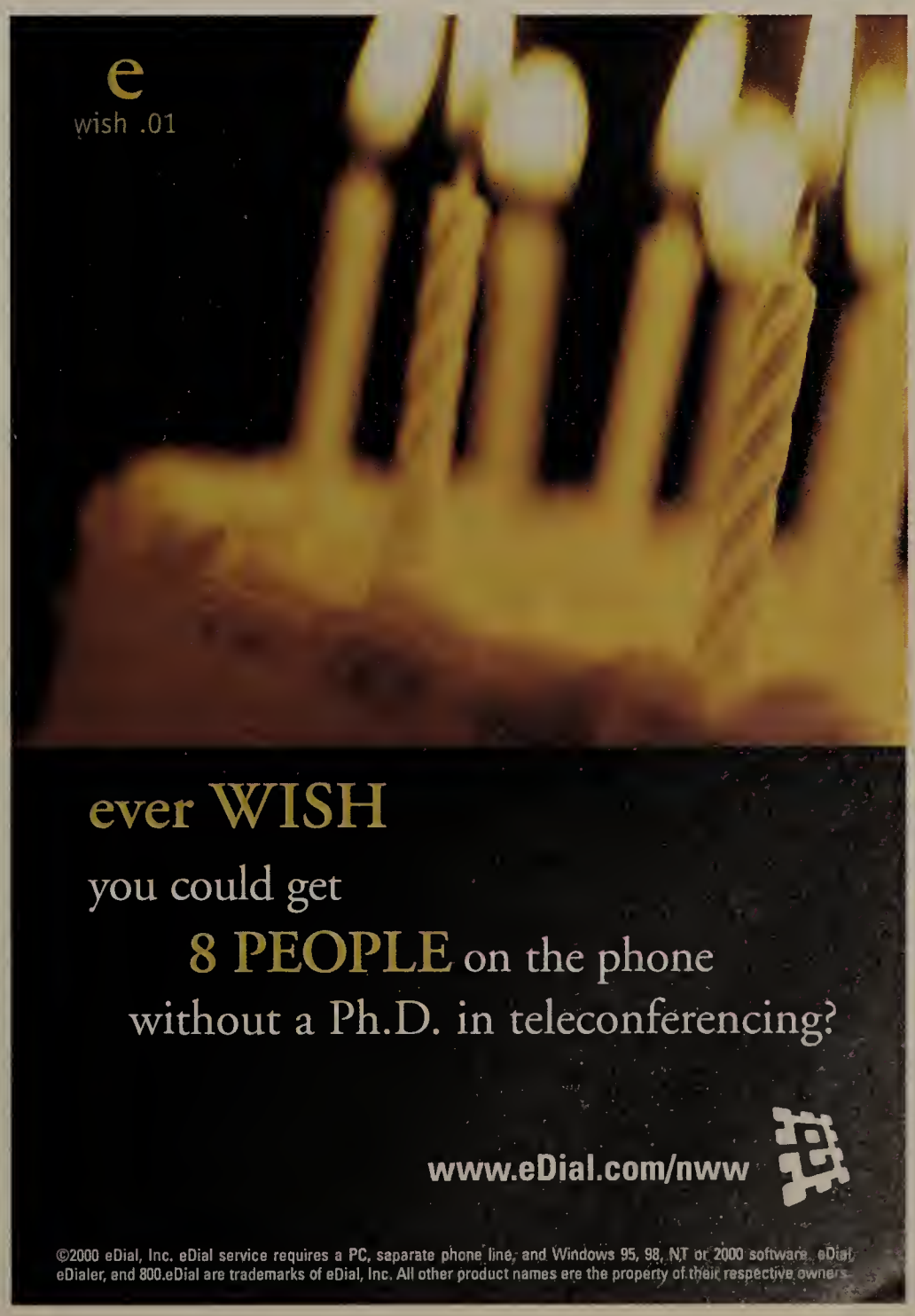
> ***"It's the 42-long jacket syndrome — white men wearing blue shirts. Change scares the hell out of people."***
>
> Charles Grantham, CEO, Institute for the Study of Distributed Work

Armin Pressler, chief technology officer of Dow's e-commerce group, says the chemical company changed its view of marketplaces when it saw how much the competition was touting in savings. For example, Shell Chemicals claims it saved $120 million through procurement in 1999, and British Petroleum says it has saved $200 million in procurement costs so far, Pressler says.

According to Deutsche Bank, Dow would have lost millions of dollars in profits if it stuck with the "do-nothing approach," he says. ◪

Correction

The story "Foundry switch flaw found; fix available," (Nov. 27, page 10), contained an error. The denial-of-service vulnerability reported in Foundry switches was in Release 7.1.08 of the company's firmware and fixed in Version 7.1.09.



Windows 2000,
continued from page 1

upgrades.

The good news for IT executives is that their discretion likely will be rewarded. Companies that have deployed Win 2000 server say it is meeting

BOB DAEMMRICH/MPG

The University of Texas' College of Business upgraded its workstation and server hardware to handle Windows 2000, says Tim Matthews, associate director of technology.

expectations for a more stable and reliable network.

An upcoming report by market research firm IDC shows that only 34.8% of shipments of NT and Win 2000 products this calendar year were Win 2000. The numbers do not include shipments of Windows 9.X products. Most of the Win 2000 shipments, however, were the desktop version of the operating system called Professional.

"Well below a quarter of the shipments were Win 2000 server," says Al Gillen, the IDC analyst who authored the report.

He notes, however, that those numbers are slightly above the 5% projections IDC made a year ago. "But clearly, Microsoft's corporate customers can no longer turn on a dime to upgrade." Gillen and IT executives attribute that to the complex network infrastructures companies are hesitant to overhaul and to the complexity of Active Directory vs. NT domains.

The bulk of Win 2000 server deployments won't come until some time next year, as many IT executives have heeded advice to perform detailed planning and exhaustive testing before production deployments.

"We've focused on doing a lot of work upfront — it's not just set up Active Directory and go," says Thom Rivera, network manager for the Colorado Department of Transportation. "We've had a pilot and test since May and learned that the rollout is painful in that you have to get it right the first time. We've taken our time to identify the pitfalls."

One of those pitfalls was collapsing multiple domains into an Active Directory domain and creating organizational units.

"We brought in consultants that had done it," Rivera says. He will begin a rollout early next year to collapse 60 LANs and multiple domains into one Win 2000 infrastructure.

Rivera's prudence is something others have ignored with great peril.

"We have one organization that we are helping through a second network design," says Charlie Haynee, enterprise architecture practice manager for Interlink, a systems integrator. "We are re-implementing and migrating from the old design to the new design. The whole environment was unstable because of a lack of planning at the server level."

He says the company underestimated the implications of directory replication, forests, sites, domains and organizational units.

The upshot for Microsoft is that sales of Win 2000 are not meeting its internal projections, according to observers. Publicly, the company says it is happy with the pace of adoptions although it won't talk shipment numbers.

> ***"We approached this operating system cautiously. With 2000, lack of planning is a disaster."***
>
> Ed Martinez, senior systems architect, Prudential Insurance

Those numbers are difficult to gauge because users can buy Win 2000 licenses and downgrade them to cover NT servers, which provides them with a "free" upgrade path to Win 2000 later on. Also Microsoft can count such licenses as Win 2000 server licenses. Microsoft did say that 12.5 million seats of Active Directory have been deployed.

"We think that is a great number, and we think we are making great progress," says Shannen Boettcher, a Microsoft product manager.

Microsoft should gain momentum from the recent availability of Win 2000 applications, such as Exchange 2000 and SQL 2000. Also, Service Pack 2 is expected to ship in February and correct flaws in Active Directory such as user group management and partitioning.

Early reviews are good

The cautious approach by customers should pay off in a more reliable network operating system. Many users, especially those in Microsoft's Joint Development Program (JDP) for early adopters, are reporting that Win 2000 is meeting their goals but is not without a few glitches.

"We had to improve the hardware for our domain controllers, which is where authentication occurs," says Tim Matthews, associate director of technology for the College of Business at the University of Texas in Austin. "Our [domain controllers] were getting hammered and had time-out errors when we added Exchange 2000."

Matthews went from Pentium III 450-MHz workstations with 256M bytes of RAM to Dell 2450 dual Pentium III 633-MHz servers with 2G bytes of RAM. He says the network is solid now and is supporting 5,000 seats of Exchange.

Matthews and others say planning, along with Microsoft's help as part of the JDP, were keys to their success.

"We approached this operating system cautiously. With 2000, lack of planning is a disaster," says Ed Martinez, senior systems architect for Prudential Insurance.

Martinez, a JDP member, says he is 20% to 25% through a deployment that will take three to five years to complete. With approximately 50 servers in production, Martinez says Active Directory is stable and performing as advertised. He also says Win 2000's reduction in reboots has helped with uptime.

But Prudential has had trouble with delegation of administrative authority, a key benefit of Win 2000 over NT. Martinez says the operating system needs better reporting for event logs and a set of reporting tools for group policy.

Just last week, Microsoft and policy management vendor FullArmour announced they are working on such a set of tools.

"Enterprises are beginning to pursue their deployments as they figure out what the operating system can do," says Josh Canary, Win 2000 business manager for consulting firm Collective Technologies. "The big attractions are enterprise management, fewer reboots, better driver and exception handling, and remote management."

But the results won't be there for those that get sloppy.

"The people that are unhappy are those that winged the rollout," Canary says.◪

MICROSOFT BLASTS JUDGE

Microsoft and the Department of Justice were back in court last week for the opening of the software giant's appeal of the landmark antitrust ruling by a federal judge to break the company in two.

Microsoft filed a 150-page brief with the U.S. Court of Appeals for the District of Columbia Circuit attacking the way Judge Thomas Penfield Jackson conducted the case, which ended June 7. Microsoft argued that the entire proceeding was "infected with error" and that the company's behavior was in fact "procompetitive, producing enormous consumer benefits." Microsoft also blasted Jackson for post-trial interviews he conducted, saying they showed his bias in the case.

AP PHOTO/ RIC FELD

Judge Thomas Penfield Jackson: Under attack in Microsoft appeal brief.

Also, two nonprofit groups, the Association for Competitive Technology and the Computing Technology Industry Association, filed friend of the court briefs arguing that Microsoft's business practices benefit the IT industry.

The Justice Department issued a statement saying it is confident in its case and is looking forward to presenting its appeal. The government is scheduled to submit a 125-page brief Jan. 12. Microsoft's reply is due Jan. 29 and final briefs are due Feb. 9. Oral arguments in the case are scheduled for Feb. 26 and 27.

— John Fontana

E-comm,
continued from page 10

on the company's Web site listed many of the new features.

In Version 5.1, the common server runtime engine has been completely rewritten using a Java programming model, Java Server Pages and Enterprise JavaBeans. The previous runtime was written in C++. Also, the catalog system has been enhanced so users can group products and catalog entries. It also allows entries to be cross-referenced to support things such as cross-sells and up-sells.

The new software fine tunes role-based access controls and buyer-profile management. It also supports pricing in the currency and format applicable to the end user.

Version 5.1 adds support for the Oracle 8i database and will run on OS/400, OS/390, Linux, and Windows NT and 2000.◪

Talk2 touts service for voice-enabling applications

Start-up's offering to be delivered through ILECs, ASPs and other service providers.

BY PHIL HOCHMUTH

SALT LAKE CITY — Talk2 Technology this week is expected to announce a service for carriers that is designed to speed the adoption of voice-enabled applications for accessing corporate e-mail, intranet and database servers in large companies.

Talk2's service lets businesses provide access to corporate resources such as e-mail and HTML documents from a phone without requiring any reconfiguration of servers, or additional hardware inside a company. The service would be available through incumbent local exchange carriers (ILEC), application service providers (ASP) and wireless providers, and sold under those providers' brand names.

Users of Talk2's service dial an access number and PIN to connect to the system through a carrier's network. With voice commands or through a touch pad, users choose what information they want, such as e-mail, calendar entries or database and HTML data from corporate servers. Users can configure preferences to voice-enable other information resources, such as stock quotes and news Web sites. Web content is made compatible with the Talk2 system using VoiceXML, a voice-enabled version of the XML standard that tags data as being compatible with a text-to-speech application.

"The serviee is an easy way for corporations to voice-enable information from e-mail or intranet servers," says Darren Wesemann, Talk2's chief technology officer. This ease of use comes from the fact that no changes need to be made to servers or network equipment to enable the service, he adds.

A corporation would use its existing WAN connection from a carrier, and install Talk2's Spontaneous Virtual Private Network [sVPN] on an e-mail or intranet server. The sVPN software provides a one-way, 192-bit IP Security tunnel from a resource server to the carrier network.

On the carrier side, Talk2's middleware runs on transport equipment, such as a softswitch or Class 4 or 5 switch. This software is used to communicate and relay data between a customer site and Talk2's data center.

Carrier networks are connected to Talk2's data center via a DS-3 or OC-3 link. The data center houses Talk2's Unix-based software platform, which is the core of the service. This software provides text-to-speech engines for e-mail and VoiceXML interpretation, and forwards the content back to the carrier's network for delivery.

"Talk2 is the first voice-portal service company I've seen that is built for carriers and takes into account how carriers build out their networks, and the scalability they require," says Mark Plakias, vice president of voice and wireless commerce for Kelsey Group.

By making its software compatible with most telco switching equipment, Plakias says, Talk2 avoids having to place its own boxes in a carrier's central office. This will ease service deployment and improve scalability for carriers, while making it more reliable for corporate customers, he adds.

Plakias' firm predicts that the number of voice portal users will grow from 1.8 million this year to 45 million by 2005. Companies in this market include HeyAnita, TellMe Networks and BeVocal.

Talk2 says it is in trials with several ILECs, ASPs and wireless provider partners, but would not name any. The service is now available to carriers.

Talk2: www.talk2.com

PROFILE: TALK2 TECHNOLOGY

Location:	Salt Lake City
Service:	Voice-based service for accessing corporate e-mail, intranet and database systems over the phone.
Founded:	1998
Key executives:	Brian Charlesworth, CEO; Dave Morton, president; Darren Wesemann, chief technology officer.
Funding:	$52 million in funding from several venture capital and technology firms, including New Media Venture Partners, Sun America Investments, Oracle and Hewlett-Packard.
Web site:	www.talk2.com

Privacy,
continued from page 12

sumers, but only 20% provide notice, choice, access and integrity.

Privacy advocates want a federal online privacy law to include a preemption clause to ensure that it overrules related state laws. They also want to prevent class action lawsuits being filed against Web site operators for privacy violations. However, these two demands are controversial and may not gain bipartisan support in Congress, experts say.

Berman warned privacy advocates not to kill a good online privacy bill because it isn't perfect. At a minimum, he says, a federal law should require notice and choice.

"There is opportunity for moderation and for deadlock," Berman says. "Deadlock is a disaster because the states are ready to roll, and then companies will have to deal with a crazy patchwork of privacy laws."

Even a moderate online privacy law will have major ramifications for corporate IT departments, says Steven Lucas, chief information officer and senior vice president of Persona, which sells a privacy-enabled permission marketing system.

"The IT departments of companies that plan to collect information about consumers are going to have to protect that information," Lucas says, pointing to investments in firewalls, network sniffers and encryption software. "They need to be very focused on security."

Lucas says IT departments also must provide:

- Database management systems that can be purged easily and regularly to accommodate consumers that want to opt out of information gathering.
- Authentication systems to ensure that people requesting access to information gathered about them are entitled to the information.
- Either online database access or an e-mail system that lets authenticated people view the information gathered about them and make changes. ◪

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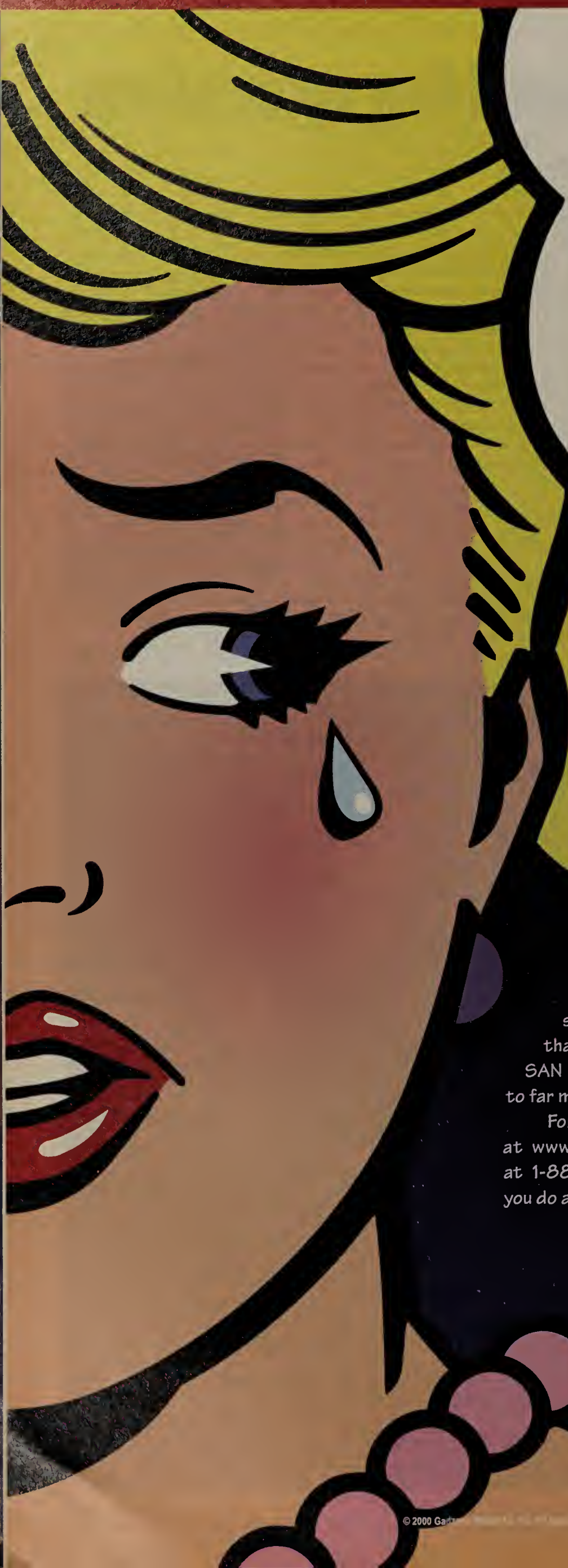

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Cisco pumps up voice-over-IP product family

BY JIM DUFFY

SAN JOSE — Cisco last week broadened its voice-over-IP arsenal with enhanced products designed to entice users to meld their voice and data nets.

The new products include a conferencing phone, a midrange handset for low- to medium-traffic requirements, a gateway that lets legacy voice mail equipment connect to Cisco voice-over-IP gear, and software enhancements for a WAN voice gateway. Together, the products are intended to match or in some cases surpass comparable product features for circuit-switched analog and digital voice networks.

In the past year, the IP telephony market has grown to $60 million from $5 million, Synergy Research Group reports. Cisco's share of the market exceeded 60% in the third quarter, they say.

Synergy expects the voice-over-IP market to exceed $250 million this year. Cisco is ready to maintain and perhaps grow its share of that market with the new IP Conference Station 7935, IP phone 7940, DPA 7630 Voice Mail Gateway and the expanded interface support on the Cisco VG200 gateway.

The IP Conference Station 7935 is the culmination of collaboration between Cisco and Polycom, a developer of voice conferencing systems. The IP Conference Station 7935 is a full-duplex, hands-free conference station for desktops and in small to midsize conference rooms.

It attaches to a Cisco Catalyst 10/100M bit/sec Ethernet switch port with an RJ-45 connection and automatically configures to the network using Dynamic Host Configuration Protocol. The 7935 is intended to match the voice conferencing capabilities users are familiar with in their circuit-switched PBX nets.

The midrange phone is called the IP Phone 7940. It fits between Cisco's high-end IP phone 7960 and the low-end 7910, and is intended to provide features and functions comparable to digital phones.

The 7940 is designed for low- to medium-traffic users who require minimal directory numbers and telephone lines.

To support legacy voice mail systems as users migrate to voice over IP, Cisco unveiled the DPA 7630 Voice Mail Gateway. The 7630 lets Octel voice mail systems, which currently connect to an Avaya Definity PBX, also connect to a Cisco CallManager system without changing the voice mail system.

Lastly, Cisco says it will support H.323 applications on various interface cards that slot into the VG200, a voice-over-IP gateway that connects Cisco IP telephony environments to the public switched telephone network or PBXs. The enhanced cards will include ISDN Primary Rate Interface and Basic Rate Interface modules, and analog E&M voice modules.

The Cisco IP Conference Station 7935 will be available next spring for $1,195. The Cisco IP Phone 7940 will be available by year-end and cost $545. The Cisco DPA 7630 is available now for $6,995. The enhancements to the VG200 will be available as part of a Cisco IOS release scheduled for the first quarter of 2001.

Cisco: www.cisco.com

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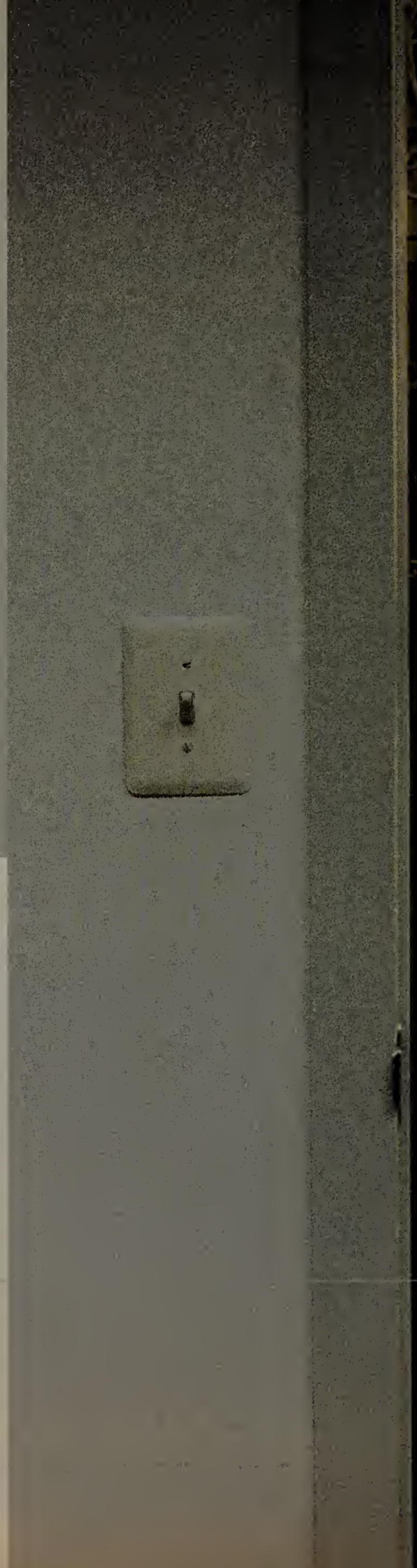

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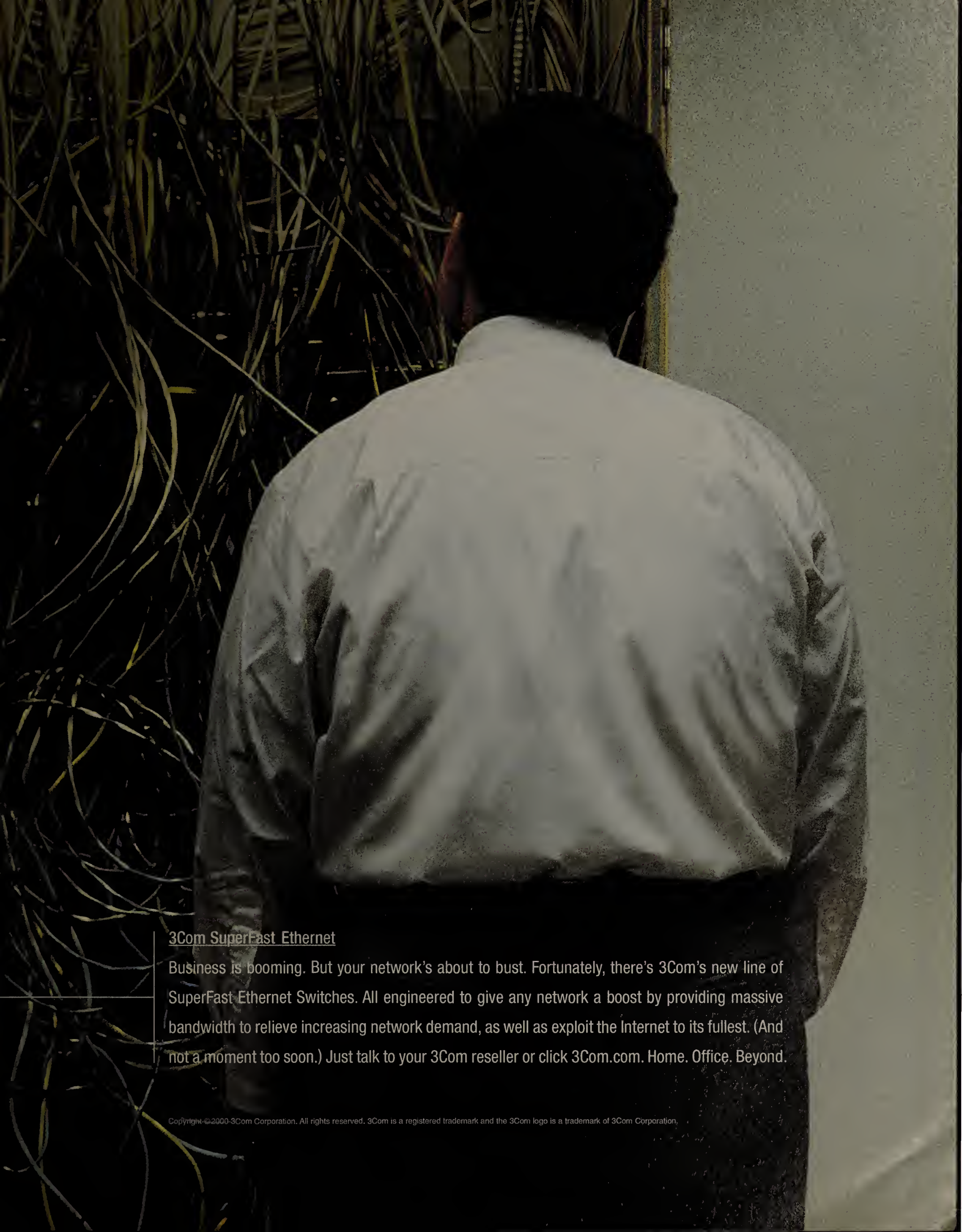

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Briefs

Hitachi Data Systems jumped into the midrange storage market last week with the introduction of a reduced capacity storage array. The Freedom Storage Lightning 9910 series storage array joins the 37-terabyte Model 9960 introduced last June. Both arrays use a switched-network architecture that increases performance, the company claims. The 9910 has a raw capacity of 3 terabytes and is housed in a single cabinet. The box works with Unix, Windows 2000 and NT, Linux, NetWare and S/390 hosts, and has Fibre Channel and Enterprise Systems Connection server connections. Prices were not available by press time.

Hitachi: www.hds.com/kage

Accord Networks will this month announce a new point-to-point gateway that can connect IP, ISDN and eventually ATM users in rich media conference calls. The GW-25, being announced this week at TeleCon West in Anaheim, Calif., can connect between 12 and 48 users simultaneously and supports audio, video and data collaboration. Accord will ship the GW-25 in January, with ATM support due out later in the year. Pricing has not yet been determined.

Accord: www.accordnetworks.com

Dutch PC maker **Tulip Computer International** is taking **Dell** to court over infringement on one of Tulip's patents. Tulip last week filed suit against Dell in a U.S. District Court in Delaware. "The infringement covers $17 billion of Dell's sales over the past three years," says Jip van den Berg, CEO of Tulip.

Tulip accuses Dell, the world's second largest PC maker, of copying a patented motherboard design.

Tulip: www.tulip.nl/

HP debuts entry-level Unix server

Company's L3000 server lets users order more power as they need it.

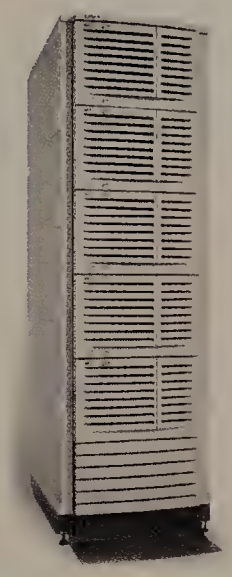
BY APRIL JACOBS

Looking to give enterprise users more speed and a clear upgrade path to its larger boxes, Hewlett-Packard rolled out a new Unix server last week that tops off its entry-level family.

For IT managers with e-commerce sites or lots of bursty traffic, the new L3000 server, which features up to four processors, could solve the problem of how to meet quick rises in demand. HP is offering pricing that lets users pay for the CPU power they need when they need it. HP plans to offer an upgrade path for users that have older L1000 and L2000 model servers in the next few months. The L1000 is a two-way system; the L2000 is a four-way system.

The L3000 can be purchased with one to four processors, or users can opt for a utility pricing model that lets them use each processor for about $100 per month. If a user with an e-commerce site gets hit with a holiday rush, for example, additional processors in the machine can be activated through an onboard management console feature. The server is preprogrammed to send an e-mail to HP that triggers usage billing to begin.

The L3000 supports PA-8600 processors running at 550 MHz, and offers more I/O and system bus throughput than the L2000. Specifically, the I/O throughput is 3.2G byte/sec, compared to 1.3G byte/sec for the L2000. The system bus runs at 4.3G byte/sec, up from 1.3G byte/sec on the L2000. HP competes with IBM, Compaq and Sun in the Unix server market.



HP's L3000 server starts at $39,000 and is available immediately.

Roy VanDoorn, director of product marketing for HP 9000 servers, says the company will continue to offer its L1000 and L2000 servers to meet user demand for lower-cost and performance servers, while also offering an upgrade path to the L3000. HP says the L2000 upgrade will be available in a few months and will require a motherboard replacement. That board replacement will give users a PA-8600 processor running at 540 MHz.

Howard Wong, director of technical operations at Meridex in Richmond, Canada, an application service provider and current L2000 user, says his company isn't likely to buy any L3000s soon because it is just reaching a point at which the performance of the L2000 is necessary, but adds that he likes the upgrade options. He says one of the main benefits he sees in HP's L-class servers is the ability to meet demand quickly.

Jean Bozman, an analyst with market research firm IDC, says HP's L3000 is an important addition to its line of Unix servers that fit into the e-commerce arena. Servers aimed at that market need to be able to meet space and performance requirements, two areas HP has tried to address with the L-class servers, including the L3000. She says HP's low-end Unix servers helped the company maintain its place as one of the top three Unix server vendors in the past year. The 1999 worldwide Unix server market accounted for $25.7 billion in revenue. In that market, Sun garnered 28.2% of the revenue; HP 22.6%, and IBM 17.7%.

HP also plans to offer customers with L2000 and L3000 server models a virtual partitioning feature in the first half of 2001 that lets them run multiple copies

See **HP**, page 26

Red Hat unveils Linux for Alpha

BY AGAM SHAH

Red Hat last week unveiled its Red Hat Alpha Deluxe, the company's Linux distribution for systems based on Compaq's Alpha chip. The operating system will come preinstalled on Compaq's ES and DS AlphaSeries servers and Compaq AlphaStations.

Based on Red Hat Linux 7.0, Alpha Deluxe contains many programming modules tuned to harness the power of the 64-bit Alpha chip, which differentiates it from Red Hat Linux 7.0 for the Intel platform, says Melissa London, spokeswoman for Red Hat.

Alpha Deluxe ships in two CDs that also contain more than 800 individual software programs for the operating system, according to Red Hat's Web site. The operating system will also have a customizable GNOME interface.

Aimed at developers, workstation users and corporate IT departments, Alpha Deluxe costs $79.95. It will be available for download at Red Hat's Web site or can be purchased through select outlets worldwide. Included in the price are 90 days of free Web support and 30 days of free phone support, London says.

Compaq is offering Linux on a number of devices, including handhelds, desktops and servers. Earlier last month, Compaq started bundling Red Hat Linux 7.0 into its ProLiant DL360 and ML330 servers. Red Hat Linux 7.0 was first introduced in September, and includes improved network, security and graphics features.

Compaq will give users a free support period to help with the installation and configuration of the systems. With Linux on the hardware, users should be able to avoid the headache of locating and installing a version of the open source operating system themselves.

For more information: Compaq: www.compaq.com; Red Hat: www.redhat.com

Shah is a correspondent with IDG News Service's Boston bureau.

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Allied Telesyn delves deeper into Layer 3

New switch/router and LAN switch products offer Layer 3 for less; company introduces Gigabit Ethernet NIC.

BY PHIL HOCHMUTH

BOTHELL, WASH. — Allied Telesyn will boost its Layer 3 product line in the next few weeks when it announces five new LAN switches and a line of hardware-based switch/routers for enterprise customers and service providers.

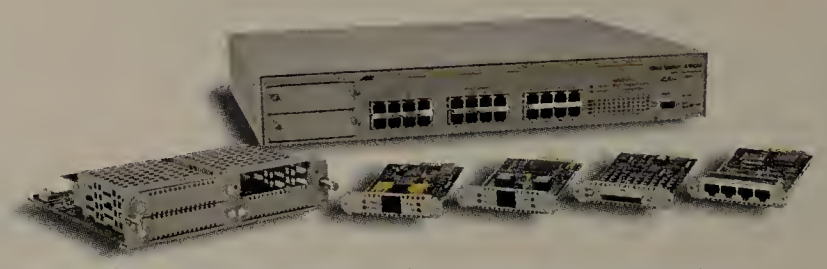
The RiverStream line of LAN switches should help network professionals who have been waiting for Layer 3 switch prices to come down before investing in the technology. Pricing per Layer 3 port starts at $97 on the RiverStream line, which is far below the industry average sale price of $598 per Layer 3 port, as reported by IDC.

For LAN workgroup connectivity, the RiverStream 8 has eight fixed 10/100Base-T ports and eight fiber Fast Ethernet ports. The RiverStream 16 features 16 all-fiber Fast Ethernet ports. The RiverStream 24 and 48 models come with 24 and 48 10/100Base-T ports, respectively, but no fiber ports. The RiverStream 6G is a six-port Gigabit Ethernet workgroup aggregation switch that comes with fixed copper- or fiber-based ports.

What separates these Layer 3 switches from the company's Rapier line of Layer 3 switches — announced last month — are the two expansion modules present on each RiverStream box. Expansion modules for the RiverStream switches include a single-port fiber or copper Gigabit Ethernet module.

The modular flexibility and low price are two key points for the RiverStream line, says Lauri Vickers, a LAN industry analyst with Cahners In-Stat.

"Allied is keeping its costs down by offering only the most popular modules," Vickers says. "Most modular switches offer everything under the sun," including legacy LAN modules for ATM, token ring or FDDI, which are not available for the RiverStream products.



The AR824 switch/router can be outfitted with WAN modules for T-1, ATM and other technologies.

According to IDC, the worldwide installed base for Layer 3 switch ports will jump from an estimated 17.3 million this year to 202.6 million by 2004, accounting for 34% of all LAN switch ports installed. As Layer 3 technology becomes more of a commodity, IDC expects the average per-port price to drop to around $200 by 2004.

The RiverStream 8 and 48 cost $4,700 each. The RiverStream 24, 16 and 6 start at $2,900, $6,400 and $5,500, respectively.

Allied Telesyn is targeting its new AR800 switch/router family at corporate customers that want to aggregate branch-office WAN connections at high speeds and service providers that offer services to multitenant buildings.

The AR800 line includes the AR824, a hardware-based router with 24 10/100Base-T ports and a WAN expansion bay for adding ISDN, ATM, T-1 or T-3 ports. These AR816 features 16 fiber ports along with the WAN expansion bay.

These products could be used as network core routing switches, or as edge devices in a corporate or service provider network, says Dick Wilson, Allied Telesyn's chief technology officer.

"If you take an AR824, you can put a [T-1] media converter on each port and make it a 24-port WAN switch," Wilson says. "This could be used in a multitenant application where you have lots of Layer 2 traffic, which you need to aggregate back to some remote central point."

T-1/Ethernet media converters are also available from Allied Telesyn. The AR824 is priced at $4,990 and the AR816 costs $8,490.

All RiverStream and AR800 products will be available at the end of the month. All switches come with basic Layer 3 features. For advanced Layer 3 features, such as routing IPX and Appletalk packets, a software upgrade of $2,000 is available.

Allied Telesyn also introduced two Gigabit Ethernet network interface cards (NIC) for servers. The single- and dual-port 1000Base-T cards are the first gigabit NIC offerings from the company.

The single-port AT-2970T and the dual-port AT-2970T2 adapters support 32-bit and 64-bit server PCI bus systems. The AT-2980T2 has two redundant ports that provide failover in case a network cable or switch port fails. Both adapters are available now, with the single-port NIC priced at $750 and the dual-port at $1,700.

Allied Telesyn: www.alliedtelesyn.com

Genesys adds VoIP to its call center suite

BY PHIL HOCHMUTH

SAN FRANCISCO — Genesys last week announced a voice-over-IP software upgrade for its call center software that will let businesses distribute call center features beyond a single central site, via the Internet, to call center agents in remote or branch offices, or agents working from home.

The VoIP Option software for Genesys' G6 suite essentially lets users run a call center over a converged voice/data network. The VoIP Option could also let businesses better integrate call centers in different parts of the country by connecting the centers over the Internet.

The ability to set up IP-based call centers is important to users with e-commerce sites, as many carry out Web-based chat sessions with customers or prepare responses to incoming e-mail about the products or services their corporation markets.

"Genesys traditionally has [been installed] with traditional PBXs to provide call center applications on top of circuit-switched networks," says John Boyle, voice-over-IP product manager for Genesys. "With VoIP Option for G6, [contact center agents] will receive calls over an IP infrastructure, which could include customers calling over the [public switched telephone network] or the Internet."

Voice-over-IP software will let businesses provide call center apps on top of circuit-switched nets.

In a corporate deployment, the G6 call center suite with the VoIP Option software runs on a Unix or Windows NT server. A circuit-switched PBX interacts with the Genesys server through an H.323 gateway that connects the PBX to the IP network, with users on the network using regular or IP phones. Calls made to the PBX are sent to the IP network through an H.323 voice-over-IP gateway, where the call is packetized. The G6/VoIP Option server receives and routes the packetized calls to the appropriate queues in the call center workflow where they are received by call center agents.

The company plans to release a version of the software compatible with session initiation protocol (SIP) gateways within the next two quarters. SIP is an emerging voice-over-IP protocol, similar to H.323.

The G6 call center suite was announced in October and provides businesses with phone contact center management and workflow setup. The suite includes tools to set up call-routing schemes, automated outbound contact tools and click-to-talk Internet support for contacting call agents via a button on a Web page.

By 2003, call center systems will make up almost 30% of the worldwide voice-over-IP revenue, projected to be $1.4 billion, according to market research firm IDC. Enterprise phone systems will account for 65% of the revenue, while hardware and software bought by voice service providers will account for the rest, IDC reports.

The VoIP Option software is available now and costs $400 per seat. The G6 suite is also available now and starts at $1,600 per user.

Genesys is an independent subsidiary of Alcatel and has been in business for 10 years. The company counts Mercedes Benz among its largest customers.

Genesys: www.genesyslab.com

www.nwfusion.com
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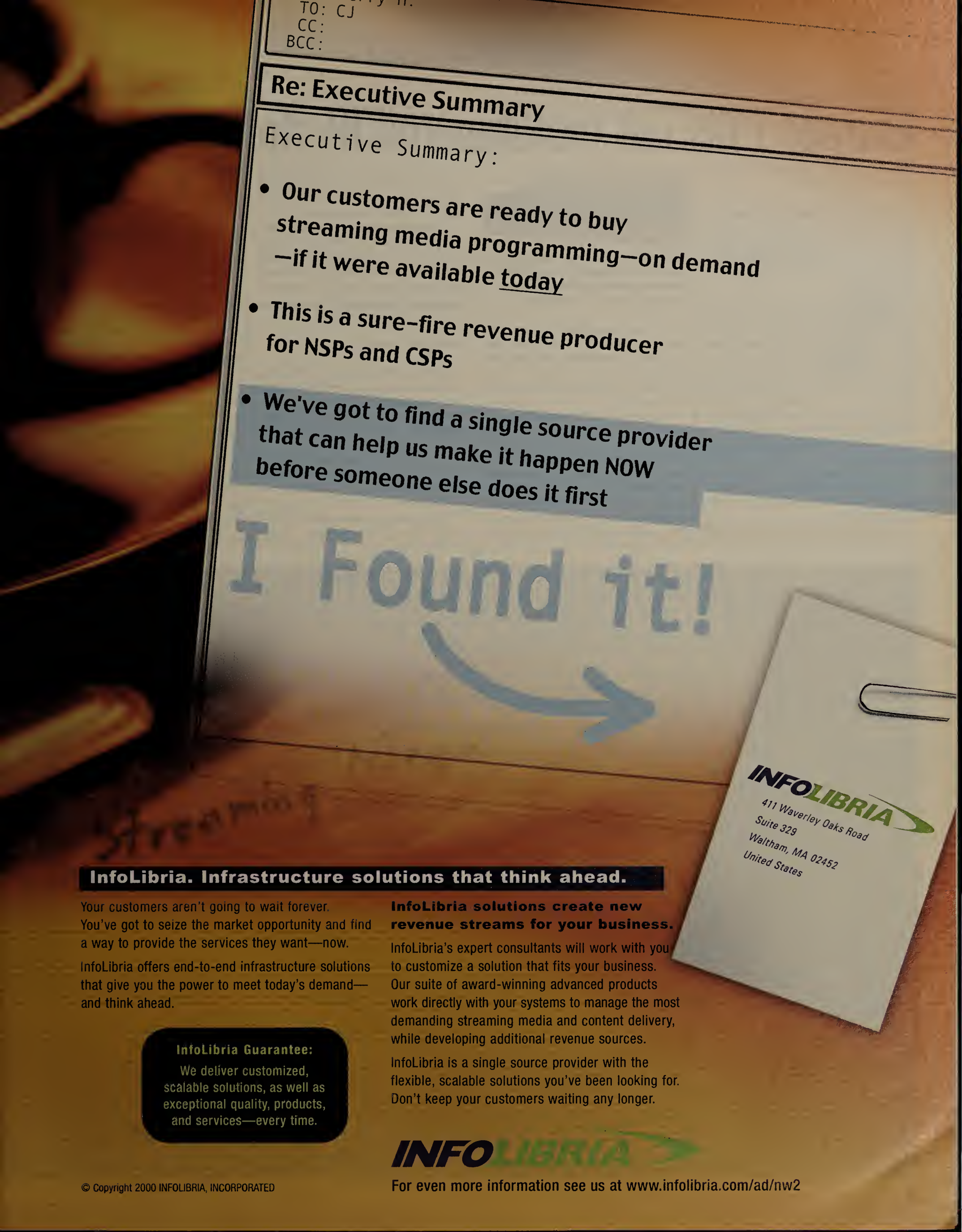

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Entrada rolls out multifaceted IP storage router

BY DENI CONNOR

SAN DIEGO — Entrada Networks last week introduced its Silverline router that promises to let companies bridge storage-area networks over WANs to replicate data or transport storage natively over IP.

The Silverline router provides access for multiple transport methods such as Fibre Channel over IP, Gigabit Ethernet, SCSI over IP and Fibre Channel backbone. Entrada claims it will be one of the first companies to offer a router that supports these access methods in a single box. In addition, the device will let enterprise customers use existing Gigabit Ethernet networks to move data over IP natively using the SCSI protocol.

The router typically sits on a Fibre Channel SAN and links to a WAN or metropolitan-area network (MAN) connection to transport data across the IP-based network.

Entrada's Silverline switch supports Fibre Channel over IP, Gigabit Ethernet iSCSI and Fibre Channel-backbone LANs, as well as WAN and MAN interfaces.

The Silverline router, which will ship in the first quarter of 2001, will ultimately support T-3, ATM, SONET and OC-3, OC-12 and OC-48 transport services. The box features two Fibre Channel ports, two WAN/MAN ports and two LAN ports.

The storage-over-IP market is growing rapidly, and a slew of companies are developing IP storage products for 2001. Among the companies working with this technology are Cisco, Nishan Systems, Pirus Networks, SAN Valley Systems, Stonefly Networks and NetConvergence. Although many large companies have adopted Fibre Channel SANs, a number of smaller companies want to transport data over Gigabit Ethernet networks using the SCSI protocol.

Next year Entrada will also introduce an optical switch called SANLight, which will tie SANs to WANs. SANLight will have multiple Fibre Channel ports and offer support for ATM, Enterprise Systems Connection, OC-3, OC-12, OC-48 and SONET, as well as feature daisy-chaining capability with switches from other vendors. SANLight will be released for beta testing the first half of next year.

Pricing is not available.

Entrada: www.entradanetworks.com

HP,
continued from page 21

of their operating systems on the server. By using multiple copies of the operating system assigned to specific processors, network professionals can better ensure that applications and end users get the performance they need.

Users can already perform resource partitioning, which lets IT managers assign specific CPU resources for applications.

The L3000 can support a variety of network and I/O connection types, including Ultra2 SCSI LVD (single and dual port); FWD SCSI (single and dual port); Fibre Channel; Gigabit Ethernet; 100Base-TX (single and quad port); 100Base-FX; ATM 155M bit/sec; ATM 622M bit/sec; FDDI Dual Attach LAN; and token-ring 100M bit/sec. The L3000 features up to 16M bytes of memory and 10 I/O slots.

The L3000 is available now and starts at $39,000. A fully configured L3000 would cost about $150,000. The L1000 and L2000 start at $14,000 and $22,000 respectively.

HP: www.hp.com

7:05 AM

As your backup window continues to shrink, your data continues to explode.

Your backup now takes a mind-numbing 14 hours instead of 6; and 40 cartridges instead of 10.

10:23 AM

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MAMMOTHTAPE technology

M2 and MammothTape are trademarks and Exabyte is a registered trademark of Exabyte Corporation.

Wired Windows . Dave Kearns

MICROSOFT HASN'T LEARNED COURTROOM HUMILITY

All along we've thought Microsoft was one of the world's greatest marketing companies. Is it possible we were wrong? Or is it just its legal team that doesn't understand how to market a product?

We've noted in the past Microsoft appeared to go out of its way to irritate Judge Thomas Penfield Jackson (www.nwfusion.com, DocFinder:2038 and www.nwfusion.com, DocFinder: 2039 are just two examples). Now in their brief to the Court of Appeals, Bill Gates' lawyers have once again egregiously insulted Jackson by, in essence, calling him incompetent and unethical.

There are four possible outcomes to the appeal: a) Microsoft will win all points (and the government will appeal to the Supreme Court); b) the appeal will be thrown out (and Microsoft will appeal to the Supreme Court); c) the appeals court will remand the case to Jackson's district court; or d) the appeals court will remand the case to another district court. In two possibilities (b and d), Microsoft will have to convince a judge or panel of justices that the appeals court and the district court were wrong. In another case (c) it will have to go back before the judge it has insulted. In only one case (a) will it be able to defend a court's action. Good marketing practice says you try to make the judge look good while attacking the outcome — similar to telling a child, "Oh look, the milk spilled. Let's clean it up." Rather than, "Idiot, you spilled the milk!"

Add to this the shotgun approach Microsoft took in the points raised in the appeal, which most lawyers found odd because one normally tries to narrow the issues to be looked at, limiting it to those that make the strongest case for you. Microsoft's brief (www.microsoft.com/presspass/trial/appeals/11-27brief.asp) brings up the judge's actions, the manner in which the trial was conducted and the witnesses' testimony. Again, bad marketing.

It seems one of the reasons Gates stepped down as CEO was to spend more time with the legal issues. If that's the case, the board of directors should take every step necessary to see that someone with marketing savvy is put in charge of legal strategy.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week

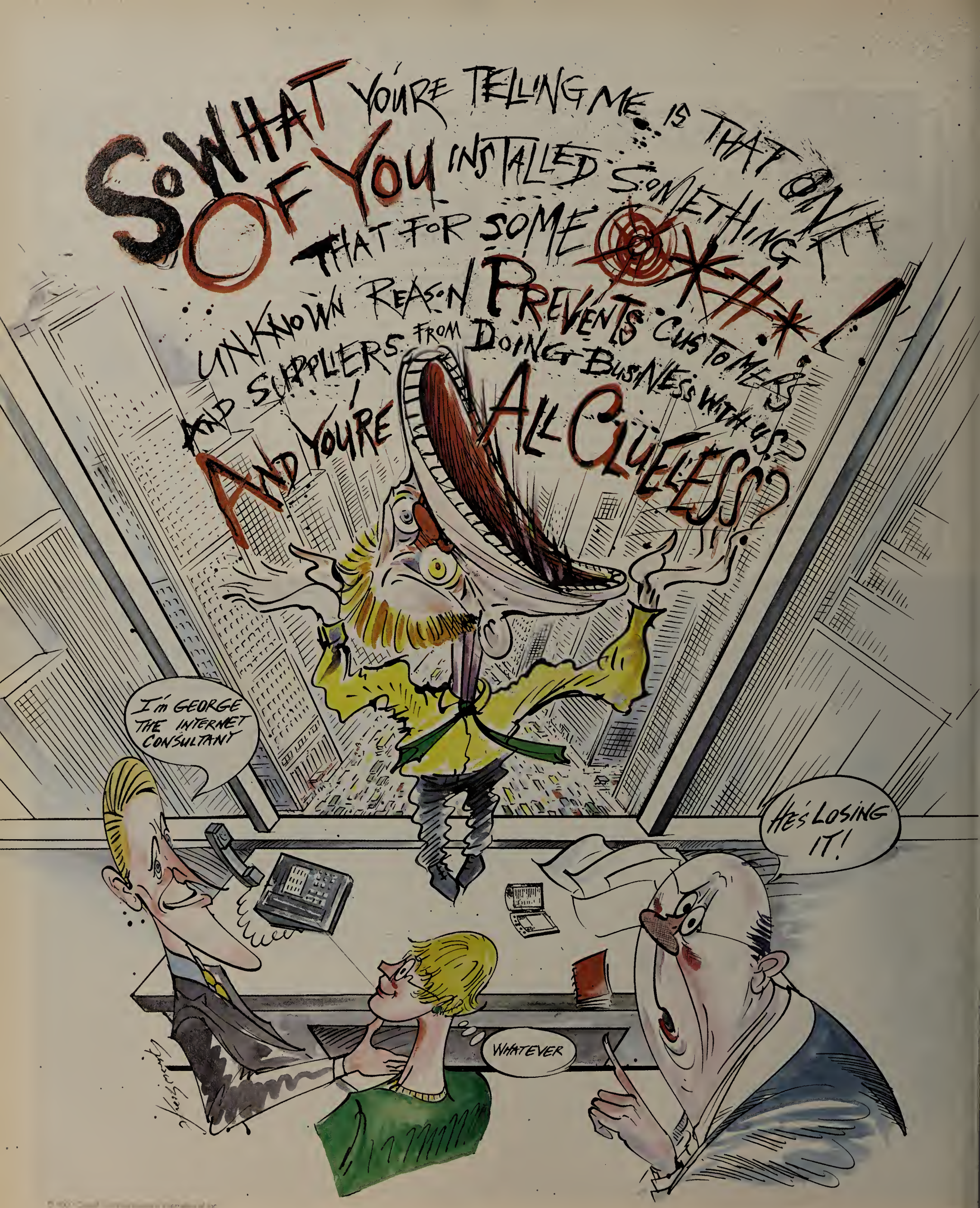
While election.com wasn't in charge of the Florida balloting, maybe it should have been. Find out more about online voting, the experience of Internet Corporation for Assigned Names and Numbers, the Democratic National Committee and the state of Arizona at www.election.com and find out about election.com's use of Windows 2000 at www.microsoft.com/windows2000/guide/datacenter/news/electionscom.asp.

1:23 PM

The hodgepodge of platforms, tape drives and autoloaders are getting impossible to manage.

Rack density and capacity continue to be stumbling blocks. You need a system that maximizes both.

8:15 PM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The jury remains out on Novell's One Net gambit

BY DENI CONNOR

Nine months after announcing its One Net strategy, Novell claims to be seeing positive results . . . results that are just starting to be reflected in the company's quarterly earnings reports. Customers, analysts and partners apparently have started accepting Novell's sweeping move away from its legacy NetWare operating system to a variety of open systems, multiplatform applications that are designed to exploit the Internet. But few company watchers stand ready to judge the effort a success at this early stage.

Novell's One Net strategy blurs the distinction between the networks users deal with every day. It treats a company's LAN, WAN, intranet, extranet, telephone network, the Internet and the computers and devices they use away from the office as a single network consisting of multiple operating systems and diverse equipment. Novell says that to safely conduct business on the Internet, users need to have directory and security services that span whatever operating system or equipment is encountered.

Customers see the strategy as a move in the right direction.

"We had a vision of one network before Novell even published its One Net strategy," says Chip DiComo, network manager for shipping firm Hellman Worldwide Logistics in Miami. "In July 1999, I presented a plan of how we were going to build a single network based upon a directory. Our network corresponds to Novell's One Net and is a huge success and a reality now."

One Net includes an array of packaged software, appliances and hosted services for large companies, OEMs and service providers. Supported operating systems include Windows NT and 2000, NetWare, Unix, Linux and limited OS/390. Novell will continue to market NetWare via channel sales and hosted services.

Partnerships are becoming increasingly important for Novell, and some experts believe the company needs to be more aggressive in that area. Novell acknowledges that it can't do everything itself, but has only recently started enlisting help from companies such as DeLoitte & Touche, Marchfirst and Cap Gemini Ernst and Young.

"If Novell continues with its timid approach to acquisitions, an inability to strike strong partnerships and a tendency to try building everything itself, the company will continue to lag behind companies such as the Sun-Netscape Alliance and IBM, which are pursuing similar cross-platform strategies," says Jamie Lewis, research director at The Burton Group.

Novell has also repositioned GroupWise and NetWare to fill multiplatform, multiprotocol roles. GroupWise works across NetWare, Windows NT and Solaris, while Novell moved NetWare to IP from its proprietary IPX protocol.

The next version of NetWare accommodates multiple processors in a server and will have storage services that work better with Linux, Win 2000 and NT, and Solaris clients. NetWare 5.1, the company's current network operating system, was introduced earlier this year as the first application server for NetWare environments, but so far has failed to garner new customers.

Cultivating a new image is important to Novell's comeback chances. The good news is that it's Novell's newest products that have garnered the best reviews. Those products include Internet Caching System (ICS), Content Exchange, DirXML and Novell Directory Services (NDS) eDirectory. ICS works with Intel servers from most systems manufacturers; Content Exchange is used by GlobalCenter, a large Web hosting firm; and a variety of corporate users have adopted DirXML and NDS eDirectory. Many users of these products, such as True North Communications and CNN, do not have NetWare in their environments.

True North, a global advertising company in Chicago, has Solaris, NT and Linux servers located in 280 cities. Richard Reid, manager of worldwide messaging and directory services, chose NDS eDirectory when the Netscape directory he had installed failed to properly replicate directory information. He put in NDS eDirectory for its replication capabilities and for its ability to work across network environments.

United Airlines bought 110,000 licenses of DirXML, eDirectory and iChain to build a customized Web portal for its employees and business partners. GlobalCenter chose Novell's Content Exchange for its combination of caching, acceleration and customer usage billing. In addition, Novell has partnered with Akamai, Digital Island and Mirror Image, three of the leading companies in Web acceleration technology.

Novell this year also announced an investment of $20 million with Sun and Compaq in CMGion, a wholly owned subsidiary of Internet giant CMGI. CMGion will build a worldwide network of data centers that will deliver content, data and applications over the Internet. Novell will contribute its directory, caching and digitalme technologies to the project.

The company has also been pushing a number of products introduced this year, ranging from a universal Yellow Pages directory called eGuide to its standards-based Novell Internet Messaging System. It has started to sign application service providers to host NetWare, GroupWise and BorderManager for small and midsize businesses.

For Novell to thrive long-term, however, the company first needs to halt a string of disappointing financial results. Novell reported a break-even performance for the fourth quarter of 2000. Although the company reported revenue from network site-licenses to large businesses and OEMs grew to $750 million from $669 million and accounted for 65% of total revenue in fiscal 2000, it also cited a 47% decrease in packaged software sales to small and midsize businesses.

In the coming year, Novell plans to introduce a secure transactions component to its ICS product, spin off its caching and content delivery division and make more of its recently introduced Novell Portal Services. The latter lets users create Web desktops that provide access to applications they use and many of the products the company offers.

Novell's Net Services strategy, which encompasses One Net, demonstrates the degree to which Novell must transform itself in order to succeed.

"How aggressive Novell is willing to be in creating that transformation will have a significant impact on the company's long-term position," The Burton Group's Lewis says.

NOVELL'S TURNAROUND STRATEGY

Network giant moves away from NetWare legacy to exploit Internet opportunities.

New within the One Net lineup

Novell introduced a number of products this year as part of its One Net initiative.

Management

- **ZENworks for Servers:** Software distribution and updating

Security

- **Single Sign-on:** One logon to network applications
- **Modular Authentication Service:** Multilayer logon

Web acceleration

- **Secure Accelerator (formerly SSLizer):** Secure Sockets Layer encryption, decryption and acceleration
- **Content Exchange:** Caching, content delivery for ISPs

Collaboration

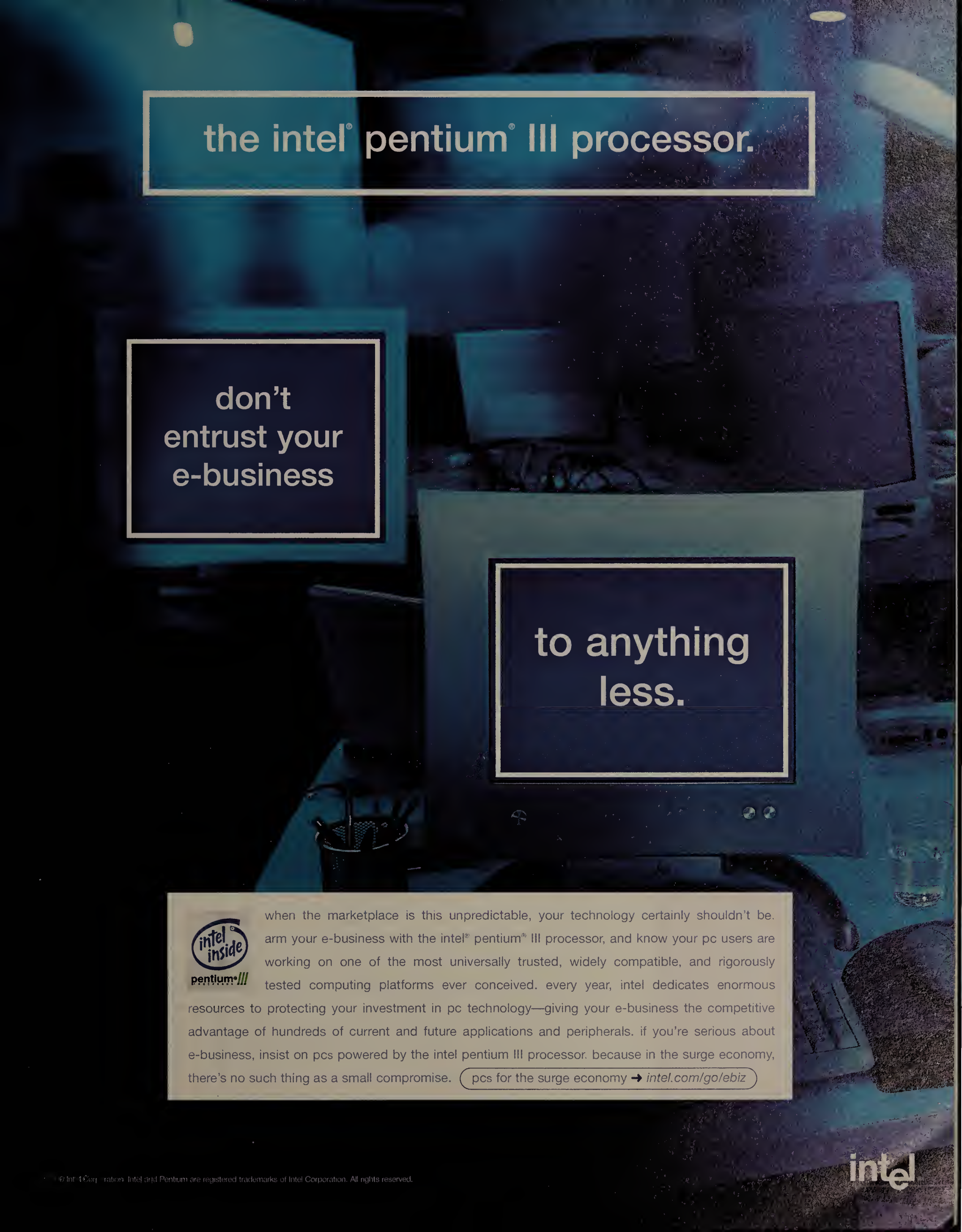
- **Novell Internet Messaging System:** E-mail
- **Portal Services:** Web-based access to a user's applications

Storage

- **Back-up Services:** Backs up NetWare
- **JustOn Hosted File Services:** Online storage services

Directory

- **NDS eDirectory:** For Windows 2000, Solaris, Linux
- **DirXML:** Language that lets applications interoperate and share data
- **iChain:** Identity management, authentication and caching
- **EGuide:** Universal directory-based Yellow Pages
- **NDS Authentication Services**



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Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

SBC Communications last week introduced OC-192 SONET service in a 12-state region. The service is available to customers in **Southwestern Bell, Ameritech** and **Pacific Bell** areas. SBC will launch the service in **SNET** territory next year. The OC-192 service will let customers transport various traffic types, including frame relay, ATM, IP and Ethernet over a 10G bit/sec ring. SBC is backing the OC-192 offering with a disaster-recovery service and 24-7 performance monitoring.

SBC: www.sbc.com

Despite some high-profile failures, competitive local exchange carrier revenues have grown by about 33% in 2000, according to the latest edition of the CLEC Report from Chicago research firm **New Paradigm Resources Group.** Total CLEC revenue in 2000 will be approximately $39 billion, up from $29.2 billion in 1999. While local service revenue has been flat, data service revenue has grown more than 61% from $10.2 billion to $16.5 billion. According to the report, CLECs provide more than 16 million access lines in 1,500 U.S. cities.

AT&T's Hossein Eslambolichi, vice president of data and Internet services, resigned last week. Eslambolichi, a 15-year AT&T veteran, is leaving to go to another telecommunications company, although it wasn't clear at press time where he is going or what role he is taking.

Eslambolichi reported directly to **Frank Ianna,** president of network services. **Art Deacon,** who has been with AT&T for 18 years, is taking over Eslambolichi's duties under the title of vice president of network operations.

Flexibility sets Yipes apart, CEO says

NetworkWorld Q3A

Metropolitan Ethernet provider Yipes Communications offers gobs of bandwidth to companies looking to connect LANs across a city or the country. Founded 18 months ago and operating in 20 cities, Yipes boasts that it can offer bandwidth at less than half the price of a comparable service from a traditional carrier. Yipes CEO Jerry Parrick recently explained how the company's business model works in a conversation with Network World's *Michael Martin.*

What lets Yipes offer large amounts of bandwidth at a relatively low cost?

It stems from the breakthrough nature of the architecture we're using. Gigabit Ethernet gives us the ability to satisfy one-megabit customers at the same time that we can satisfy gigabit customers. There is no other architecture that has that range of scalability or that range of flexibility.

On top of that, we can give customers the ability to control their own networking by giving them a Web interface and allowing them to do prioritization and bandwidth online, [in] real time. Moving Gigabit Ethernet out into the wide-area and the metropolitan network and turning it into a carrier-class platform is what essentially is the breakthrough.

CINDY CHARLES/MPG

What are the bandwidth ranges you're offering?

Customers can pick any combination of megabits from one megabit up to a gigabit in one-megabit increments.

And they're able to do that on the fly?

Today, once they're connected, if they want to alter their bandwidth they call us and within a matter of a few hours we can remotely enable more bandwidth. By the first quarter of next year, we'll have a Web interface where they can go online and change their bandwidth and the prioritization of their traffic.

Our objective is to give them greater control than they've been able to achieve with other suppliers. For example, we're working to allow them to reserve additional bandwidth at a fixed point in time in the future and to have the additional bandwidth added and taken away after the need is satisfied. So if you think of a customer who knows they're going to do a video teleconference a week from now, we want to give them the ability to say, 'Next Tuesday at 10 a.m., I want an additional 4M bit/sec allocated between Point A and Point B, and I want it for four hours.' There's no upgrade or equipment required.

See **Yipes**, page 36

AT&T Broadband puts brakes on gear deliveries

Seen as a message to the financial community, the decision causes concern among vendors.

BY DENISE PAPPALARDO

AT&T's cable network operator has notified its network equipment vendors that it will not accept shipments for the remainder of the quarter, a move experts describe as a signal to Wall Street that the company is serious about controlling costs.

AT&T Broadband "wants to be sure that its capital budget and spending line up at the end of the year," according to a company spokesman. He added that the company has enough equipment in stock to proceed with existing network build-out plans, and customers will not be affected.

While it is not clear how many equipment vendors are being turned away, several say fourth-quarter revenue will be affected.

Antec, which supplies AT&T Broadband with voice over cable network equipment, may be the most significantly hurt, although not from a quarterly earnings perspective. AT&T Broadband is Antec's largest customer. The company's stock took a dive last week when Antec announced AT&T Broadband's plans. However, the company says year-end revenue projections will be met due to previous sales.

Harmonic, Com21 and Scientific Atlanta expect fourth-quarter revenue to be about 2% lower based on lower-than-expected sales to AT&T Broadband.

While other cable service providers have occasionally stopped accepting shipments from equipment vendors toward the end of a quarter, most don't make public announcements about such actions, says Mike Paxton, senior analyst at Cahners In-Stat Group.

"I wouldn't call this a [public relations] ploy, but the public nature of the event may be a real message for Wall Street and the investment community," he says.

AT&T Broadband did not issue a press release announcing that it would stop accepting shipments, but it did notify its vendors. Several vendors put out releases briefly explaining how AT&T's decision will impact quarterly earnings. There are likely several other vendors impacted, but they have not issued press releases.

The intended message for Wall Street is

See **AT&T Broadband**, page 36

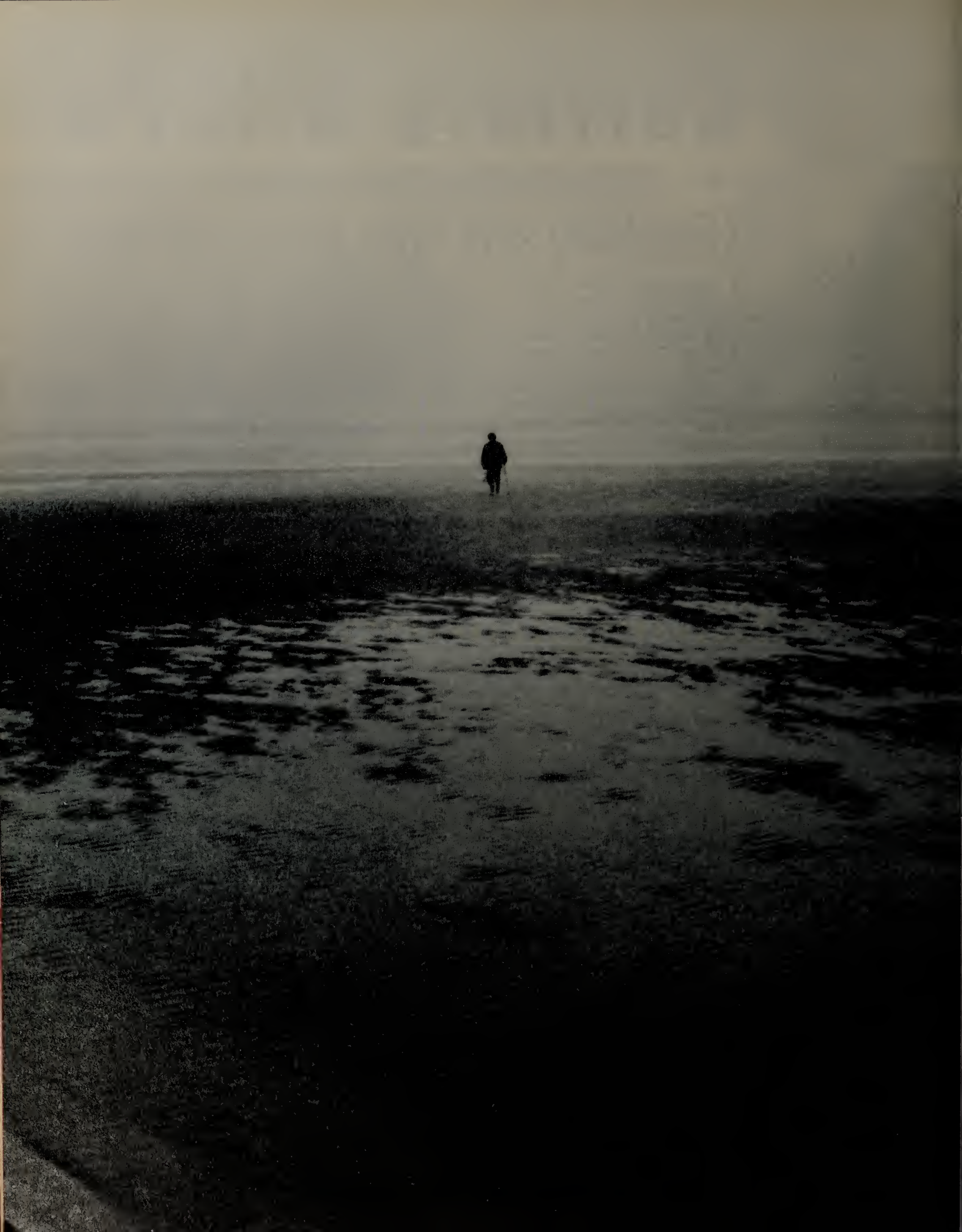
www.nwfusion.com

BREAKING UP IS HARD TO DO

More information on AT&T's other recent woes.

DocFinder 2035

find it



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Yipes,
continued from page 33

What applications are driving the demand for this bandwidth?

Our core application is built around LANs and connecting them together. So our MAN service connects multiple buildings within a region. The second application we're focused on is connecting LANs to the Internet and providing high-speed Internet access. And we also connect LANs across the country with our WAN service. Any application that runs over a LAN can run over this network. So any application you run in your local computing environment can take advantage of our network.

Who do you view as customers — mostly ASPs, ISPs and large companies?

In our original business model we thought our sweet spot would be midsize, multilocation, regional businesses. We thought connecting five law offices in the San Francisco area would be the prototypical model. What we've found is there are bandwidth needs across the entire enterprise [market].

Who do you view as your competition?

The principal competitor is the incumbent who has all the T-1 and DS-3 business today. And anyone who's saddled with a SONET and ATM infrastructure that makes their services very costly and inflexible.

Can you offer quality of service (QoS), like SONET and ATM, across Ethernet?

Our principal application is LAN connectivity. We're not trying to serve the trading desks at Solomon Smith Barney with 15 tubes sitting in front of every trader and billions of dollars of transactions running every minute. That's not our sweet spot. We may grow up to there some day, but that's not it presently. For connecting LANs, we're very competitive.

With QoS we have queuing capability with four levels of prioritization. By next year we think we'll be competitive QoS-wise with anything ATM has to offer. As for availability, most carriers talk about 99.999% availability. Having been with the traditional carriers for 27 years of my career, I can suggest it's difficult for any carrier to demonstrate they're offering 99.999% availability. We can deliver at least 99.99%, and we're confident that next year we'll be operating at 99.999%.

With SONET, people talk about survivability — if the loop is cut, traffic will run in the other direction. That failover takes about 50 milliseconds. We bring a fiber pair in from one direction and terminate it on one Gigabit Ethernet port, bring the other end of the fiber ring in from the other direction and terminate it on a separate port and that allows the router to work very much like SONET. The difference is the speed of the failover. It takes a few seconds for us. ◪

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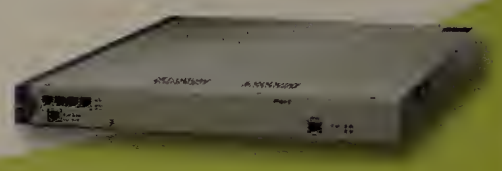

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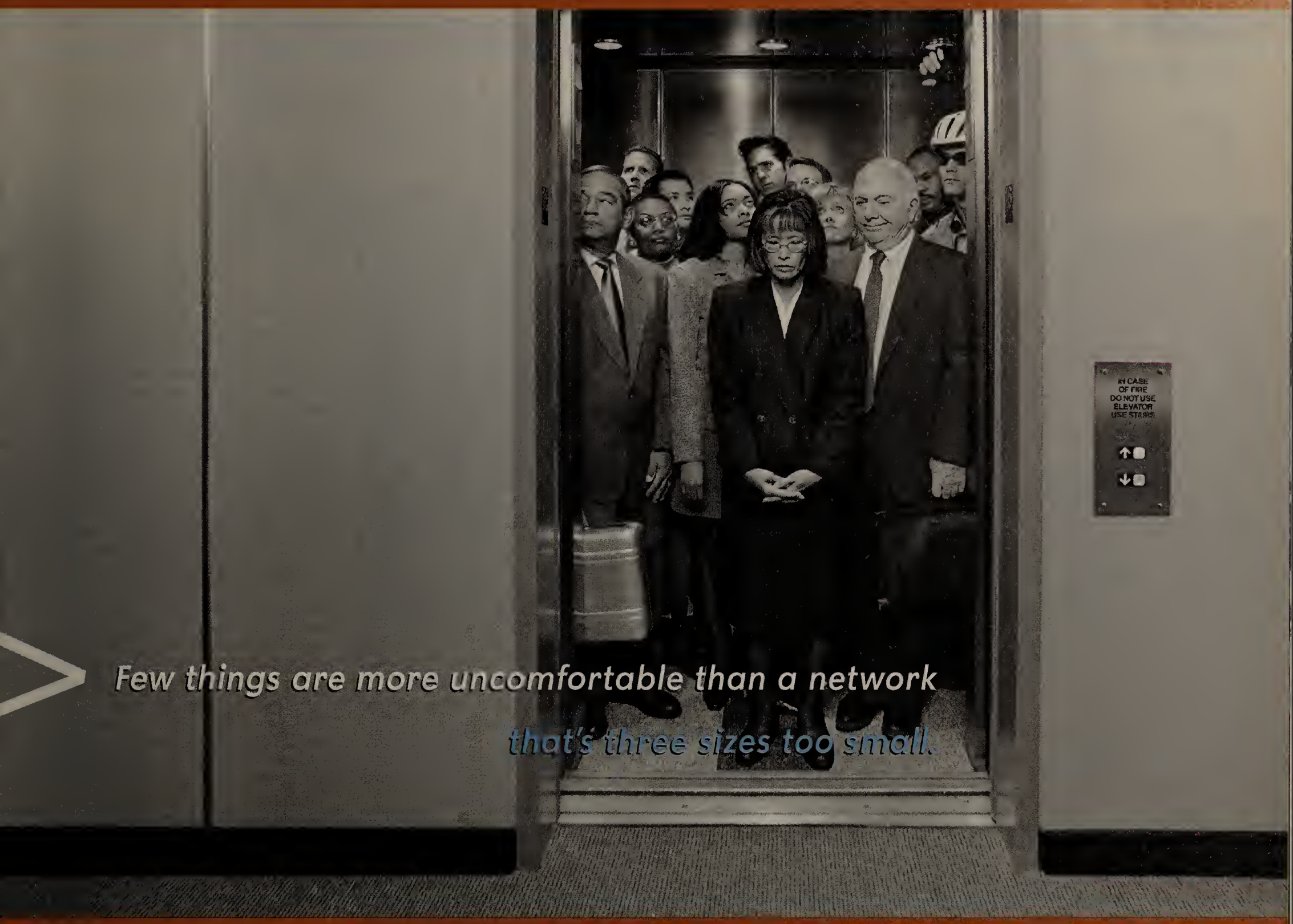
AT&T Broadband,
continued from page 33

that AT&T Broadband will cut costs when necessary and not overspend, Paxton says.

The company has good reason to be concerned about such messages. When AT&T last month announced its restructuring plans, the company stated its intention to spin off AT&T Broadband with an initial public offering next year. AT&T has been criticized for first spending too much for its cable properties and then not signing up enough new customers, especially in the cable telephony arena. "The company is healthy," Paxton says, but needs to boost profits.

AT&T Broadband expects to resume accepting network equipment shipments in January, a spokesman says. ◪



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Eye on the carriers . David Rohde

THE MYTH OF ONE-STOP SHOPPING

One of the favorite conceits of competitive local exchange carriers is that they're nimbler than the fat, old telephone companies and more adept at putting together one-stop packages of cool, new services.

But in the telecom world, claims of fleet-footedness run up against two harsh realities. One is that new carriers usually have to get most of their local loops from old carriers. The other is that no matter how slick the executive team, new carriers' front-line troops are often greenhorns.

These facts hit home for me and my colleagues at *Network World* and *Computerworld's* joint Washington bureau in our disastrous move earlier this month into a new office building operated by realty firm CarrAmerica, part-owner of the freshly minted carrier BroadBand Office (BBO).

We moved our furniture and equipment on Friday night, Nov. 17. But as I write this column at home a week and a half later, we still don't have enough voice and data lines for all of our people to actually go to work there.

We signed our lease with CarrAmerica on Sept. 20 with assurances that the building would be wired to the gills by BBO and ready to go before move-in. What happened next is the typical gory tale of runaround phone calls, faxed paperwork revisions and number-portability fights with our old building's provider (WorldCom) that you telecom managers may recognize.

But here's the killer. Ultimately BBO is just selling us resold local dial-up lines from Verizon. How many times have you heard new carriers whine about the need to hook into Bell companies' automated provisioning systems? At BBO the order, when ready to go, was a piece of paper awaiting a move by somebody to call Verizon and place the order.

As Gary Turner, BBO's director of field operations, admitted: "We had a change in procedures here, and it sat on a person's desk for two weeks and nothing happened."

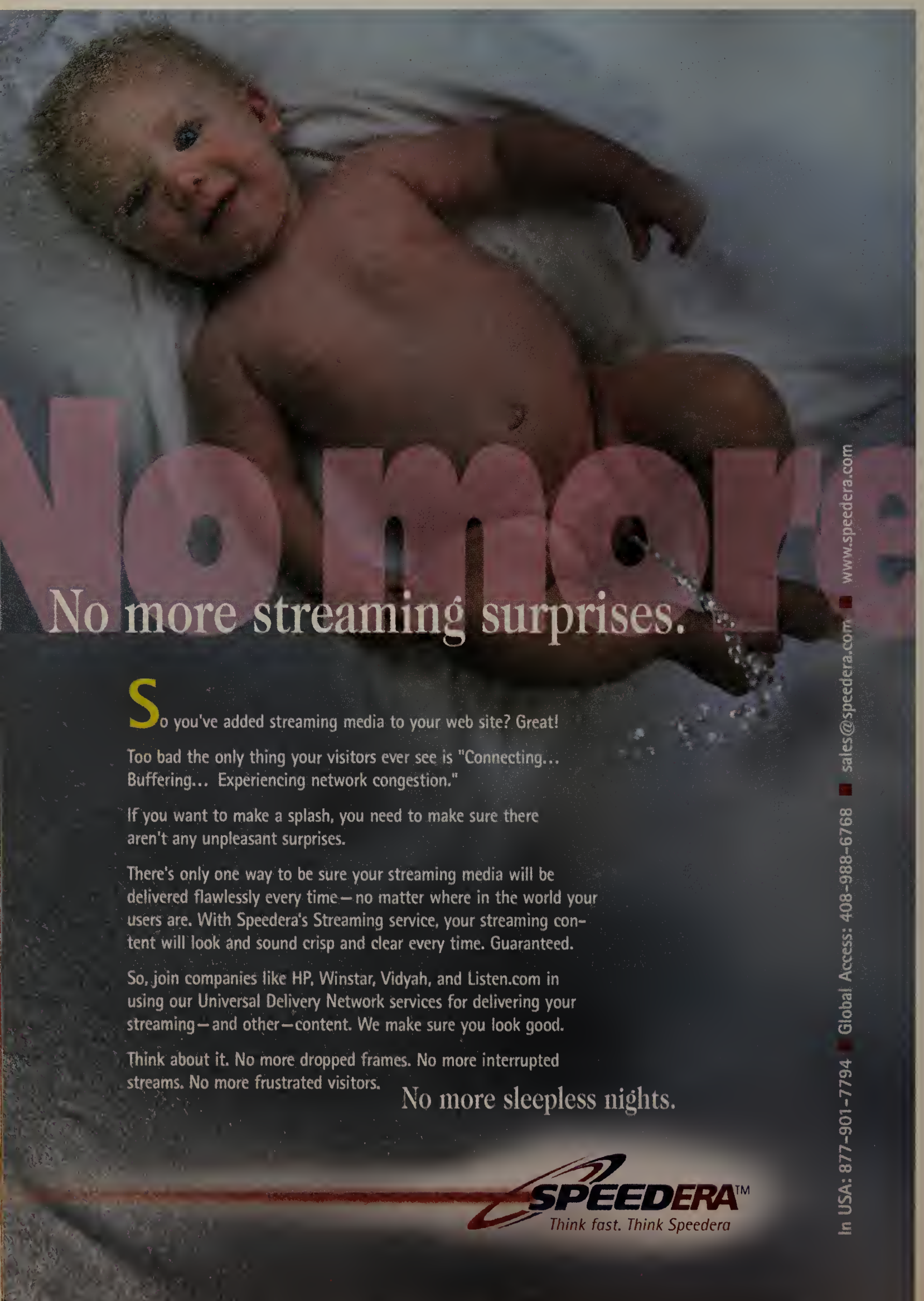
After some final inquiries, we were told a few days before the move that the lines weren't in. BBO then put in an emergency order — essentially starting all over — with Verizon.

Incredibly, we had separately ordered Covad Communication DSL lines through its partner UUNET, and much the same thing happened. A Covad technician showed up before the move but found an unoccupied office with insufficient wiring and security and left — forgetting to tell us. It is a story wonderfully laid out by my colleague Denise Pappalardo in her ISP newsletter (www.nwfusion.com, DocFinder: 2027).

Our staff has dealt with these various carriers, exponentially increasing the level of vendor doubletalk. So where's the one-stop shopping?

As this column has pointed out before, "bundling" of services is not necessarily the big deal that vendors and analysts make it out to be. It even appears that when a carrier promises "one-stop shopping," it's really sort of a service aggregator, meaning there are more vendors involved, not fewer, and more chance for mistakes. Is that the future of carrier services?

Rohde is managing editor of The Edge section of Network World. *He can be reached at drohde@nww.com.*



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The Edge

Service provider developments at the juncture between the enterprise and the new public network

Briefs

Copper Mountain and **3Com** last week announced the integration of Copper Mountain's CopperView network management system, which remotely manages users' DSL customer premises equipment and service providers' DSL access concentrators, with 3Com's CommWorks 5020 Intelligent Activation System server. The CommWorks 5020 automates DSL account-activation processes for voice and data services, and can now configure asymmetric DSL, symmetric DSL, ISDN DSL and G.lite line cards in Copper Mountain's CopperEdge DSL Concentrators. The two firms say their joint goal is to lessen DSL ordering hassles and installation intervals.

Copper Mountain: www.copermountain.com; 3Com: www.3com.com/solutions/svprovider/index.html

Neutral collocation provider **Equinix** has announced a 450% expansion of its year-old Washington, D.C.-area Internet Business Exchange center to 180,000 square feet. Demand for cabinet space from AT&T, WorldCom, IBM and others is driving the expansion. Equinix, which took its stock public in August, has six Internet business exchange centers with a total 543,000 square feet of space in the New York, Washington, Chicago, Dallas, Los Angeles and Silicon Valley areas.

Equinix: www.equinix.com

The U.S. Supreme Court last week cleared the way for the Federal Communications Commission to re-auction 90 wireless personal communications services licenses previously held by bankrupt **NextWave Telecom.** The court let stand an appeals court ruling that NextWave's bankruptcy court can't stop the FCC from canceling the NextWave licenses and re-auctioning them. The auction is scheduled for Dec. 12.

Corporate demand may prop gear sales

Service providers still expect to cut overall capital expenditures in 2001.

BY JIM DUFFY

Corporate demand for next-generation telecom services may keep service providers buying new equipment in 2001, despite forecasts that growth in their capital expenditures will slow.

Recently, concern arose that service provider capital expenditures would decrease dramatically, which helped drive the Nasdaq down 5% two weeks ago.

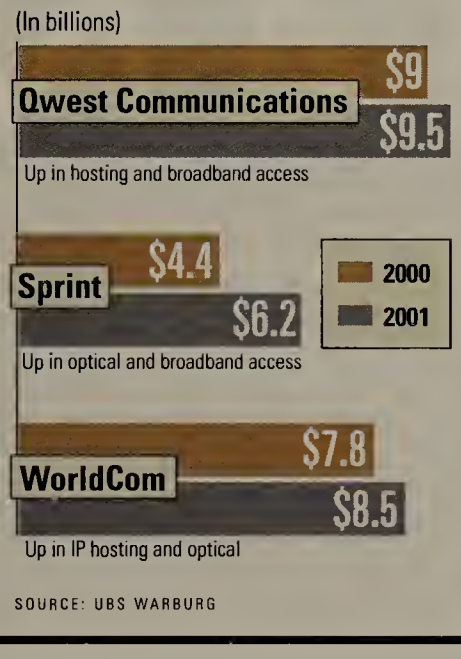
But corporate users looking to outsource or off-load application processing, network operations and Web site administration will actually keep service provider spending robust in 2001, analysts say. It won't hurt that demand for high-speed Internet on-ramps remains intense, they add.

Telecom equipment spending grew 35% in 2000 and is forecast to grow 20% in 2001, according to two investment firms that track the equipment and service markets.

"We believe, though, that a true sense of where we are headed will not be clear until early next year," financial research firm UBS Warburg stated in a recent report.

Spending up

Capital expense projections show the following areas of growth for three of the top interexchange carriers:



SOURCE: UBS WARBURG

Although growth projections for 2001 are substantially lower than 2000's figures, analysts expect strong spending for Web hosting, which includes routers, servers and load-balancing switches. They also anticipate heavy expenditures for broadband access equipment, metropolitan-area optical gear and softswitches.

The reduction in capital expenditures growth from 2000 to 2001 is largely due to market conditions. Service providers are under increasing pressure to demonstrate sustainable profitability to receive funding from investors. This requirement has hit competitive local exchange carriers (CLEC) particularly hard. Some have been forced to lay off workers and curtail service rollouts, and some analysts say they cannot cite one CLEC that has made a profit.

Another factor slowing growth is a slowdown in spending on traditional telecom gear, such as circuit switches, time-division multiplexing equipment, SONET add/drop muxes and legacy data infrastructures, analysts speculate. Service providers are gradually replacing traditional telecom gear with gigabit/terabit routers, dense wave division multiplexing, softswitches for packet-based voice,

See **Slow growth**, page 44

Cost-effective trunking helps rural telco with DSL

BY DAVID ROHDE

McMINNVILLE, TENN. — Who says an independent telephone company in a rural area can't offer DSL service cost-effectively?

For such telcos, there are two principal hurdles to overcome. One is extending DSL service by retrofitting outmoded digital-loop carrier (DLC) systems that extend loops away from central offices but typically block DSL signals. The other is finding relatively inexpensive ways to trunk the resulting traffic when the telcos don't necessarily anticipate huge initial demand.

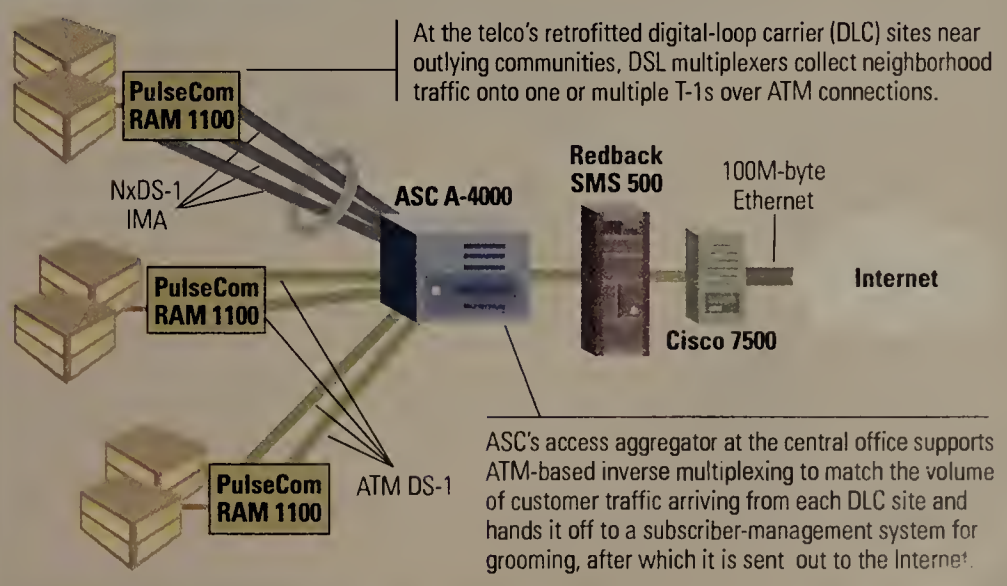
Tennessee's Ben Lomand Telephone Cooperative is attacking both problems with the help of a passel of vendors targeting DLC upgrades and flexible access aggregation.

Ben Lomand serves about 36,000 cus-

See **Ben Lomand**, page 44

Far-flung but cost-effective DSL

How Ben Lomand Telephone Cooperative lines up DSL volume with appropriate trunking:



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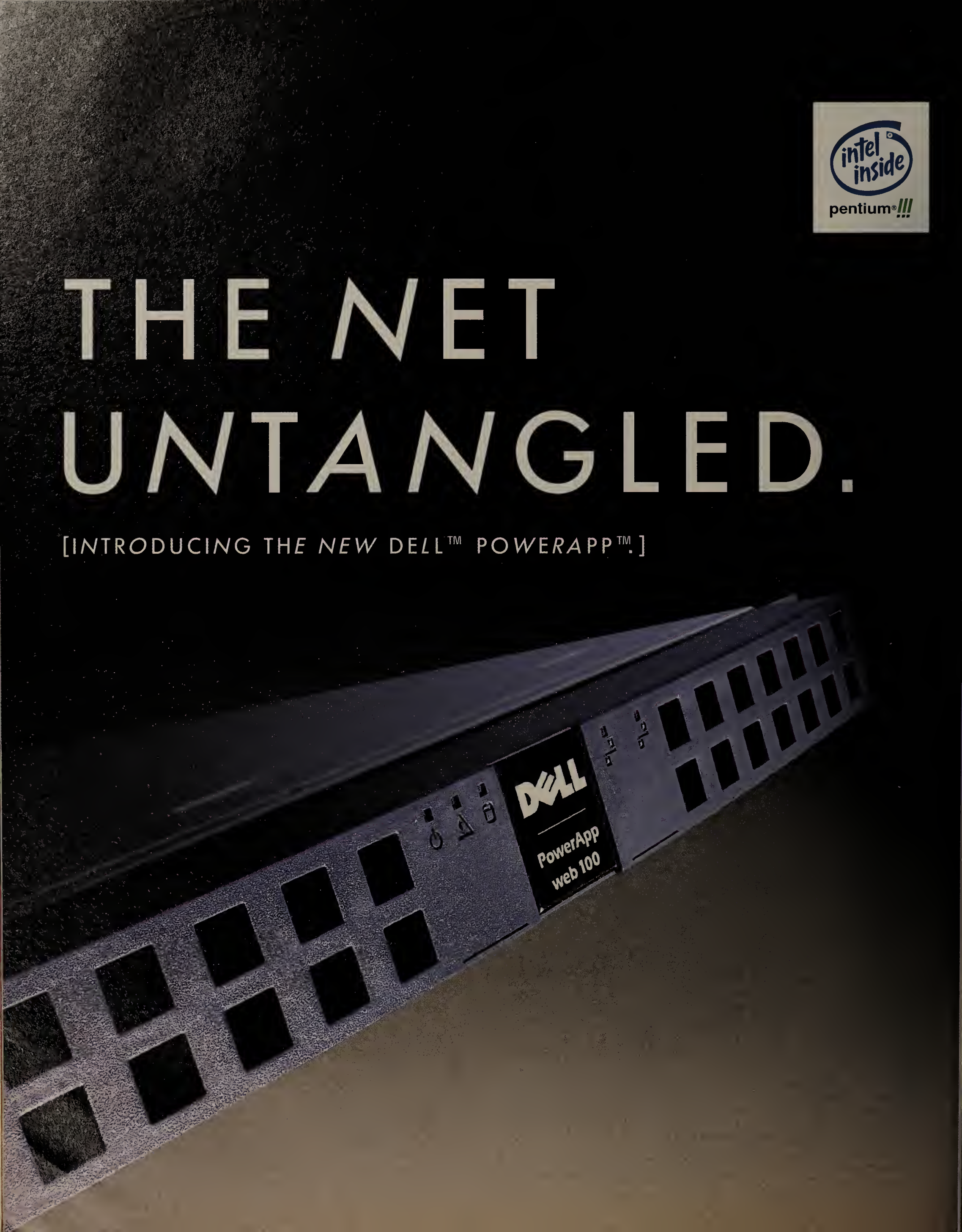

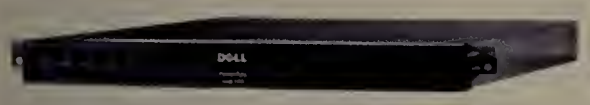

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- PowerApp™ Kick-Start Deployment Utility
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General Bandwidth caters to the needs of RBOCs

G6 voice gateway boasts standards that the local telephone companies demand.

BY TIM GREENE

AUSTIN, TEXAS — Unlike some of its competitors, General Bandwidth is taking aim at the regional Bell operating companies in its effort to sell a voice-over-broadband gateway.

The company has bent over backwards to make its G6 voice gateway attractive to RBOCs rather than to upstart carriers. The G6 meets not only the standard physical requirements that RBOCs demand, but also extensions of these requirements, some of which are demanded by just one RBOC.

In addition, the company says it's making the G6's management software compliant with the standard operational support system (OSS) used by many RBOCs. This OSS software compliance will make it possible to provision services from their existing OSS, the company says.

Perhaps significantly, SBC Communication's investment arm has a stake in General Bandwidth.

Most gateway vendors think competitive local exchange carriers (CLEC) or ISPs will be the first to buy their gear, with the RBOCs following. General Bandwidth, though, is making sure its products will meld easily with RBOC networks as soon as possible.

These broadband voice gateways are connected to aggregation devices, such as DSL access multiplexers, that collect customer traffic sent into the service provider network via DSL links. This traffic can be voice and data sent as IP packets or ATM cells.

Voice gateways strip voice traffic and convert it to traditional time-division multiplexed traffic that can be handled by public phone networks. This enables calls originating on a broadband packet connection to be completed to customers that have regular phone service.

Many CLECs see bundling voice and data services on a broadband connection to customer sites as a way to break into local phone markets against the RBOCs, so they are a natural target of companies selling voice gateways.

Because they own the traditional local phone networks, RBOCs are perceived as being slower to adopt broadband voice and data services. They are headed that way, but it will be a multiyear effort.

In catering to the RBOCs, General Bandwidth says its gear passes a smoke test that's required by Verizon but no other RBOC. Also, it passes an earthquake test that only SBC requires for areas of California and an altitude test that US West wants for mountainous parts of its territory.

This is in addition to Network Equipment Building Standard (NEBS) compliance the equipment has. NEBS is the standard RBOCs demand equipment meets before it is installed in their networks.

General Bandwidth is also making the management software for its equipment compliant with the standard OSS interfaces used by RBOCs. This will mean RBOCs can remotely provision G6 gateways using their existing OSS, eliminating the need for switching from management platform to management platform to provision a single service across multiple network elements.

General Bandwidth: www.generalbandwidth.com

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Ben Lomand,
continued from page 41

tomers spread across 3,200 square miles — an average of 11 per square mile. To do this requires 130 DLCs, or remote terminal locations, serving the co-op's three central offices.

So in January Ben Lomand began testing DSL equipment — PulseCom's WavePacer RAM 1100 units — installed in remote terminals.

It also originally deployed stackable, 12-port integrated access devices (IAD) in one of its central offices to terminate the connections.

But the IADs didn't leave the telco with enough flexibility to choose the most cost-effective trunking, forcing a choice between a large number of separate T-1 lines back to the DLCs as DSL demand grew or, alternatively, expensive and likely underutilized T-3 links.

So in early spring, a team led by Ben Lomand network engineer Joe Hamby began testing the chassis-based A-4000 multiservice access aggregator from Advanced Switching Communications (ASC) of Vienna, Va.

The 18-slot A-4000, mounted in a telco rack in a central office designated for DSL terminations, offers smaller carriers a relatively low buy-in cost because the intelligence is entirely placed in the 24-port cards that go into the slots. According to ASC, Ben Lomand began with two A-1240 24-port cards — each port supporting a T-1 connection — and an A-5010 OC-3 card in combination with a Redback SMS 500 to provide DSL subscriber management (see graphic).

A fully loaded A-4000 can aggregate up to 392 T-1 ATM connections from Ben Lomand's 130 remote sites. But notably, the A-4000 also supports bundled T-1 connections using the inverse multiplexing over ATM (IMA) standard from the ATM Forum, a feature that Hamby is considering employing as DSL traffic increases.

"The 1240 cards were half the price and double the amount of T-1 ports" of the stackable IADs, Hamby says. By early summer, Hamby had the ASC A-4000 live in his central office and he began migrating his customer connections from the IADs.

The A-4000 proved easy to administer, taking less than 10 minutes to provision a new T-1 port. "It's as easy as falling off a log," Hamby says.

In addition to Internet access over DSL, Ben Lomand plans to offer VPNs and transparent LAN services. ◪

Slow growth,
continued from page 41

and DSL and cable-access technologies. The decrease in spending on legacy gear is not yet offset by the uptick in spending on next-generation equipment.

The growth lag is not due to any decreased demand for new services from companies, and that's leading carriers to continue to seek increasing returns on investment in bandwidth.

"You've got a bandwidth demand curve on your network that's going through the roof," says Robert MacLellan, director of business analysis at RHK. "I don't think the capital expenditures crunch will affect the ability of an enterprise to get next-generation services as long as the end goal hasn't changed for the carriers, and as long as the enterprise IT managers have a realistic time frame in mind."

Some industry pundits project 2001 spending growth to be as low as 3% to 5%, but that doesn't wash with investment firm JP Morgan.

"We believe that this estimate will likely prove to be extremely conservative," the firm wrote in a recent report. "To believe that spending growth will slow to the low, single-digit range in 2001, you would have to believe that service providers have decided to give up on the quest to build large, end-to-end, scalable next-generation networks."

Like UBS Warburg, JP Morgan believes spending growth will be in the 20% range for 2001, and optics, IP routing and wireless could experience 40% to 60% growth.

But another analyst says spending will be hard-pressed to grow 20% next year.

"Twenty percent strikes me as a bit much, based on the layoffs and cutbacks we've seen," says Jeff Moore, senior analyst for network services at Current Analysis. "There's an increased impetus to demonstrate that you're profitable. Reality has reasserted itself, and CLECs that have been largely driving capital expenditures have to scale their expectations to match reality."

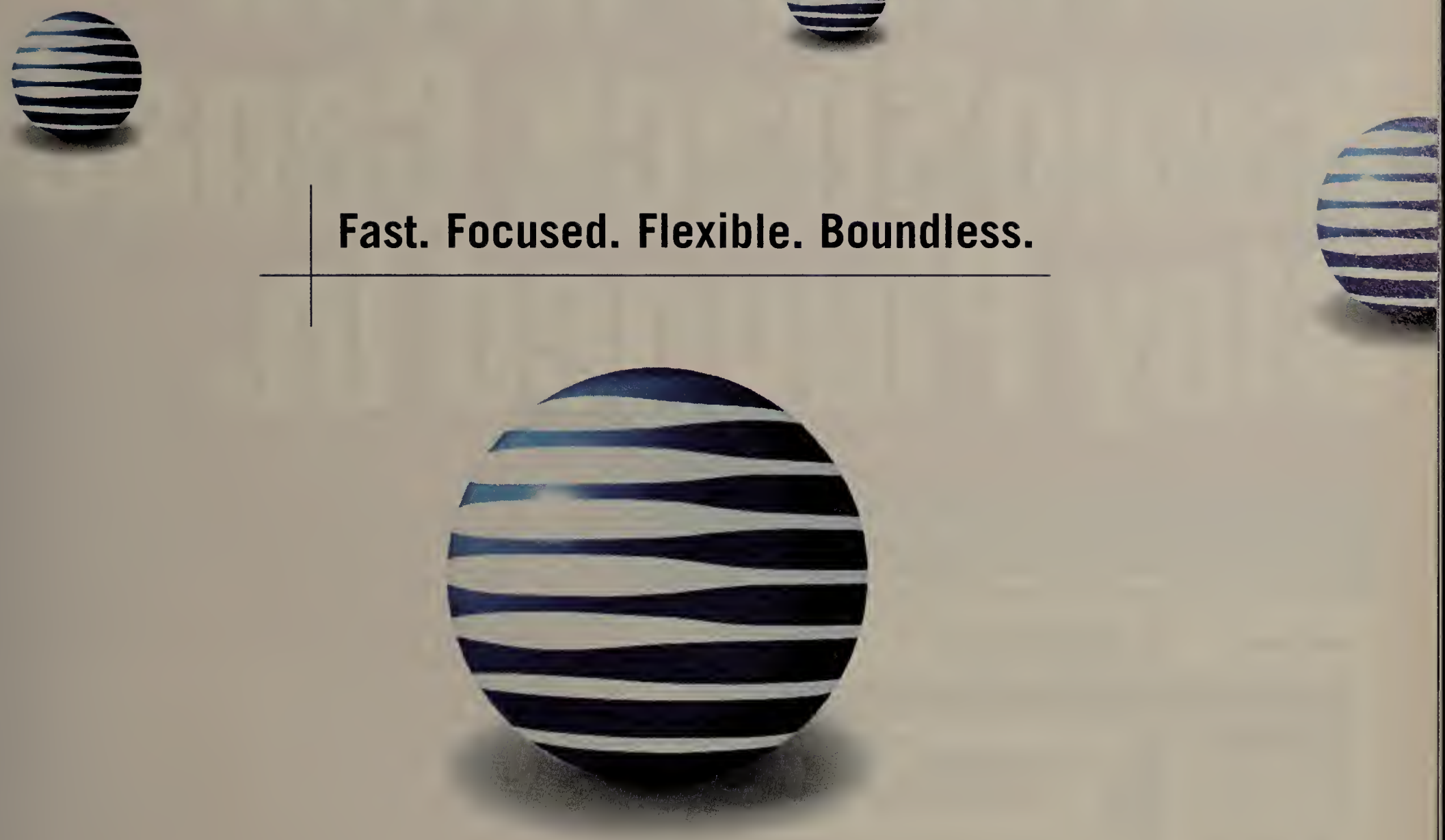
Spending growth has even slowed among large, profitable interexchange carriers, according to Infonetics Research.

That's largely because of the sheer volume of players and dollars, says Kevin Mitchell, directing analyst for service provider networks at Infonetics. "When the numbers are getting large, the growth has to slow," Mitchell says.

Infonetics says spending among tier-one service providers in the U.S. will grow 54% in 2001. Spending growth will slow to 40% from 2001 to 2002, the firm estimates.

"You can't grow at 50% forever, or at 30% forever," Mitchell says. "There are some markets that are growing only at 3% or 4% per quarter."

Dial-access concentrators and DSL access multiplexers are slower-growth markets, Mitchell says, while gigabit/terabit routers and optical switching and transport systems are accelerating. ◪



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Briefs

Peregrine Systems, which purchased Harbinger earlier this year, last week said it is offering flat-rate pricing — as opposed to kilobyte-based pricing — as an option on data-conversion services, such as converting SAP datastreams to xCML, electronic data interchange or fax. Pricing starts at $150 per month, per trading partner for online exchanges using Peregrine e-market group services.

Peregrine:www.peregrine.com

BroadVision has announced an upgrade to its One-to-One Enterprise online business application platform. Version 6.0 will support the Java 2 Enterprise Edition platform, and continue to support open standards including JavaScript, C++ and Common Object Request Broker Architecture. The upgrade will run Sun Solaris and Hewlett-Packard's Unix operating systems. It is scheduled to ship by March 31, but pricing won't be released until 6.0 is shipped.

BroadVision, www.broadvision.com

Interland, a full-service Web hosting firm, said last week it has paid $1.45 million to license Systar's **OmniVision** software, a system monitoring tool that provides information about Web performance and system capacity. With the OmniVision software, Interland's customers can access Web performance data via their Internet browsers. The OmniVision software collects kernel-level information from each system within an infrastructure, processes it and then provides reports detailing application and system performance. IT managers can use the information to identify potential problems and pinpoint system overload.

Interland: www.interland.com

Motive eases online customer service

BY CAROLYN DUFFY MARSAN

Motive Communications, a provider of software for online customer service, this week will announce a set of prepackaged, reusable software components that makes it easier to embed customer service features into complex, e-business applications.

Called Olympus, the new components come bundled with Motive's service offerings, direct from Motive or through consulting partners. Olympus lets corporations integrate frequently asked questions and instant messaging into e-business applications with user-based content that is generated on the fly.

The components offer out-of-the-box compatibility with leading e-business software platforms including SAP, Bowstreet, Vignette, Commerce One, VerticalNet Solutions and Siebel. The components are specified in XML and are focused on vertical markets, including financial services, communications, energy and e-marketplaces.

PROFILE: MOTIVE COMMUNICATIONS

Location:	Austin, Texas
Service:	Software packages for online customer care.
Founded:	1997
President & CEO:	Scott Harmon
Customers:	FannieMae, Merrill Lynch, Reuters, Target, UPS.
Employees:	270
Fun fact:	Motive has signed six deals in the past six months worth more than $10 million.

Wells Fargo rolled out a Motive-based online technical assistance application for 4,500 of its loan officers in August. The application lets loan officers solve simple technical problems, such as repairing and compacting a corrupt database, without having to call the help desk.

"One of the main reasons we chose Motive was because . . . it allows you to create a support platform and put the components on top of that platform," says Peder Malchow, director of IT customer support for Wells Fargo's home mortgage group. "We've started out small, just focusing on our internal technical support. But we could conceivably take Motive out to all our internal and external support."

Malchow says Wells Fargo will offer the Motive online technical assistance application to 10,000 additional home mortgage group employees by year-end. So far, the response from Wells Fargo employees has been positive.

"They really enjoy having more choices and not being at the mercy of our help desk managers," Malchow says. "They can just point, click and fix close to 80% of their problems."

Mike Maples, co-founder and vice presi-

See **Motive**, page 54

Novadigm software targets mobile user mgmt.

BY DENISE DUBIE

EMERYVILLE, CALIF. — With firms supporting growing numbers of mobile users, network professionals may not always know what remote users have running on their computers or how to manage those devices. Novadigm thinks it can help.

The company this week will release Radia Inventory Manager, software that lets customers track software, applications and the number of licenses being used on their networks. Having this information gives network managers an exact count of what they have and what they need to put on their shopping lists. The information also helps network professionals determine which users need software upgrades or more PC memory, and if software licenses are current.

The firm says Radia Inventory Manager competes most closely with Microsoft's System Management Server, although Novadigm's software claims to run across more systems than SMS.

Radia Inventory Manager joins the company's Enterprise Desktop Manager (EDM), Radia Application Manager and Radia Software Manager in its suite of automated software and content management products. EDM automatically distributes software across the network, and Radia products enable Web site software installations, updates and repairs. Radia products always performed some basic network discovery, but the company developed Radia Inventory Manager to better manage mobile devices.

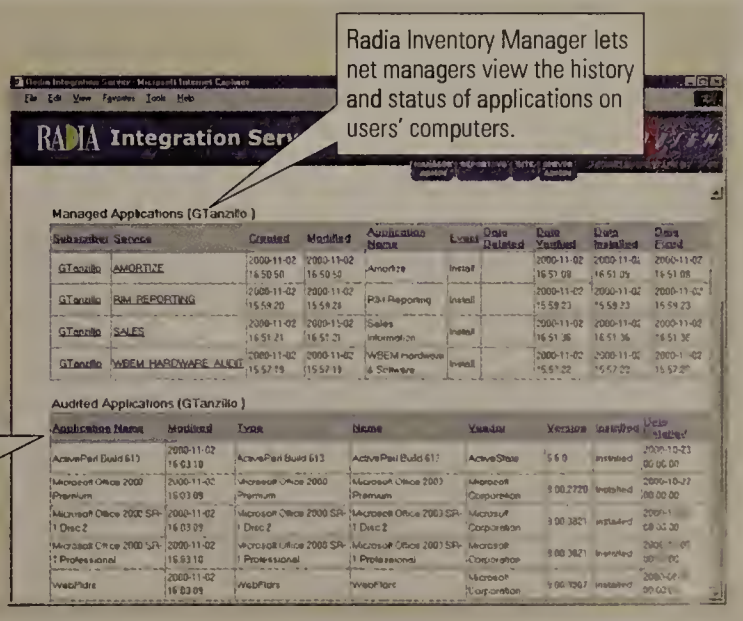
Radia Inventory Manager is comprised of two parts, server software, and agents that are installed on the managed devices. From the server, customers can schedule times to collect inventory information, and the agents deliver that information back to the server. That information is correlated and put into reports that can be accessed with a Web browser.

Users can program Radia Inventory Manager to extract and store remote sys-

See **Novadigm**, page 54

Taking stock of your network

Novadigm's Radia Inventory Manager discovers networked desktop configurations and presents information in Web-based reports.



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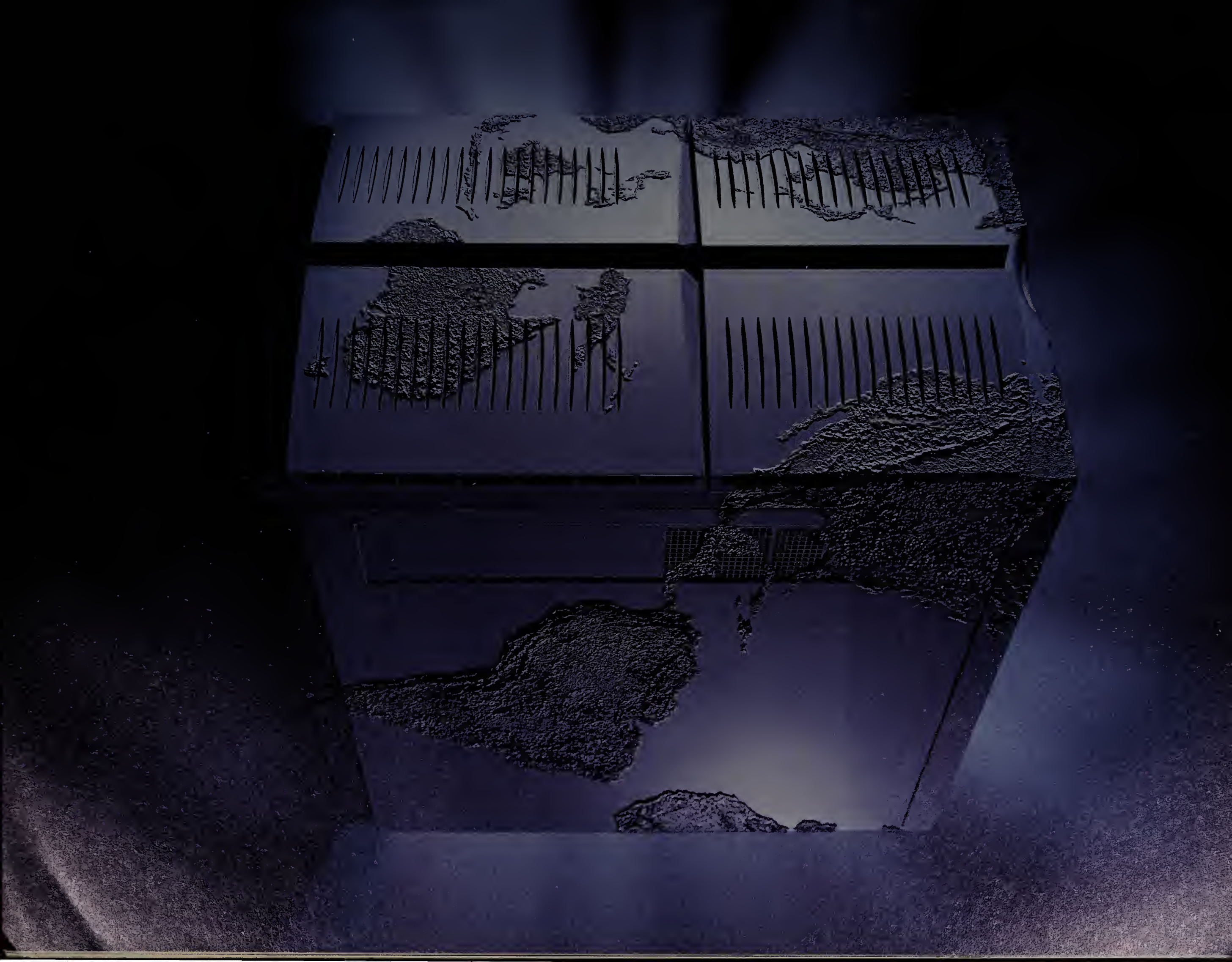

RecoverySafe helps heal ailing Windows systems

Software maker imagine LAN unveils browser-based tool to help users bring corrupt PCs back online.

BY JOHN FONTANA

NASHUA, N.H. — IT executives are not only habitually concerned about how efficiently their Windows-based networks run, but how fast they can recover from inevitable failures.

A new tool for addressing the latter is scheduled to ship in January from imagine LAN. The company's RecoverySafe gives IT administrators a centralized console that can remotely bring corrupt servers and desktops back online.

The browser-based tool lets administrators manage registry and configuration files on Windows servers and desktops. Those files can be used to recover from problems resulting from hardware and software conflicts, third-party drivers or software that crash a machine after installation, or when a user changes a system configuration that renders the computer inoperable.

Other vendors, such as Aelita Software and Ecora, also offer enterprise configuration management software. Windows Millennium Edition (ME), the newest version of the Microsoft operating system, has a similar capability for recording and restoring registry and configuration information. Windows NT also offers tools, but it lacks the central console and automatic restore features found in RecoverySafe.

"A lot of people are talking about self-healing or mission-critical recovery," says Tony Bailey, an analyst with Enterprise Management Associates. "It's beneficial if you can put out fires automatically or assist network administrators in doing it." But Bailey says that while protecting PCs is important, what's also critical on the server side is making sure applications stay up and running.

RecoverySafe does not address applications but the underlying operating system. The software comes with consoles for administrators and client PCs.

The Administrative Console can be used to remotely restore machines as well as for scheduling snapshots at various intervals.

Users also can produce change reports to compare the before and after results of a system restore. The administrative software supports the Windows Management Interface and the Web-based Enterprise Management standard so it can be integrated into existing management infrastructures.

"We developed these network features so users can quickly restore any configuration and systems file over an IP system," says Kirk Olsen, director of development for imagine LAN.

The Administrative Console relies on the Client Console, which is installed locally on the PC, to take a "snapshot" of the registry and configuration files and store it on the machine.

With either console, users can restore the system using a browser interface if the corrupt machine can be booted into Windows or Safe Mode. A command line prompt also is available if the machine must be booted using a floppy disk, but the feature cannot be used over the network.

The command line works with several boot drive files, including File Allocation Table, FAT32 and NT File System.

RecoverySafe, which is expected to ship in January, supports Windows 95, 98, ME, NT and 2000. Pricing has not been set.

Imagine LAN: www.imaginelan.com

PC protection

The RecoverySafe tool from imagine LAN provides customers with a centralized console for capturing registry and configuration data and for restoring corrupt machines. The package can:

- Take scheduled or on-demand snapshots of PC configuration files and registry keys.
- Automatically restore settings on PCs.
- Produce change reports of PC status before/after restore.

Corio service to tackle legacy applications management

New offering provides hosting, storage and account management for a single monthly fee.

BY JENNIFER MEARS

SAN CARLOS, CALIF. — Corio has come up with a fresh twist on its application service offerings. Rather than just deliver new applications to customers, the company is also going to support customers' existing applications.

Corio's Intelligent Infrastructure service will offer customers a personalized package of managed services — such as hosting, storage administration and account management — for a monthly fee.

"We view ourselves as an IT factory. This is really a configure-to-order type of thing, so customers can tailor it to meet their particular needs," says Richard Hillebrecht, Corio's vice president of operations.

One example is a company that has licensed and implemented enterprise resource planning (ERP) software from PeopleSoft, but wants to refocus its technical resources on other projects. Corio can move the company's PeopleSoft application onto servers managed by Corio and take over the maintenance of that application.

Corio is responding to customer needs by offering them bits and pieces of their ASP infrastructure. "We view ourselves as an IT factory."

Richard Hillebrecht, Corio vice president of operations

Lack of tech support

Another company may have SAP's ERP applications running on a data center and network it's satisfied with, but lack the technical resources needed to administer the software. In that case, the company could contract for Corio's application technical support, and Corio's SAP experts would tap into the customer's data center remotely to handle administration, Hillebrecht says.

Other application service providers, such as USinternetworking, also offer assorted hosting and other nontraditional ASP services, although most target independent software vendors (ISV) looking to deliver their products via the Internet. Corio will address ISVs too, but its new offering focuses on corporations looking to better manage their applications.

Corio's new offering puts the company more into competition with Loudcloud, which manages software, hardware and network services for customers. Corio hopes to have an edge based on its expertise in delivering application services since 1998.

Who pays for all of this?

Amy Mizoras, an analyst with market research firm IDC, says it's good that Corio is leveraging its expertise, although she wonders where Corio will come up with the resources to integrate and manage a slew of different legacy and proprietary applications. "I'm skeptical they might bite off more than they can chew," she says.

Hillebrecht says Corio isn't seeking to be the expert in all applications. The idea, he says, is to offer companies Corio's technical expertise and hardware resources and then create a partnership with the customer's IT staff, which may retain some responsibility, or the software vendor. "It's not Corio providing 100% of the solution; it's Corio putting together the solution with the ISV and the customer," he says.

Corio: www.corio.com

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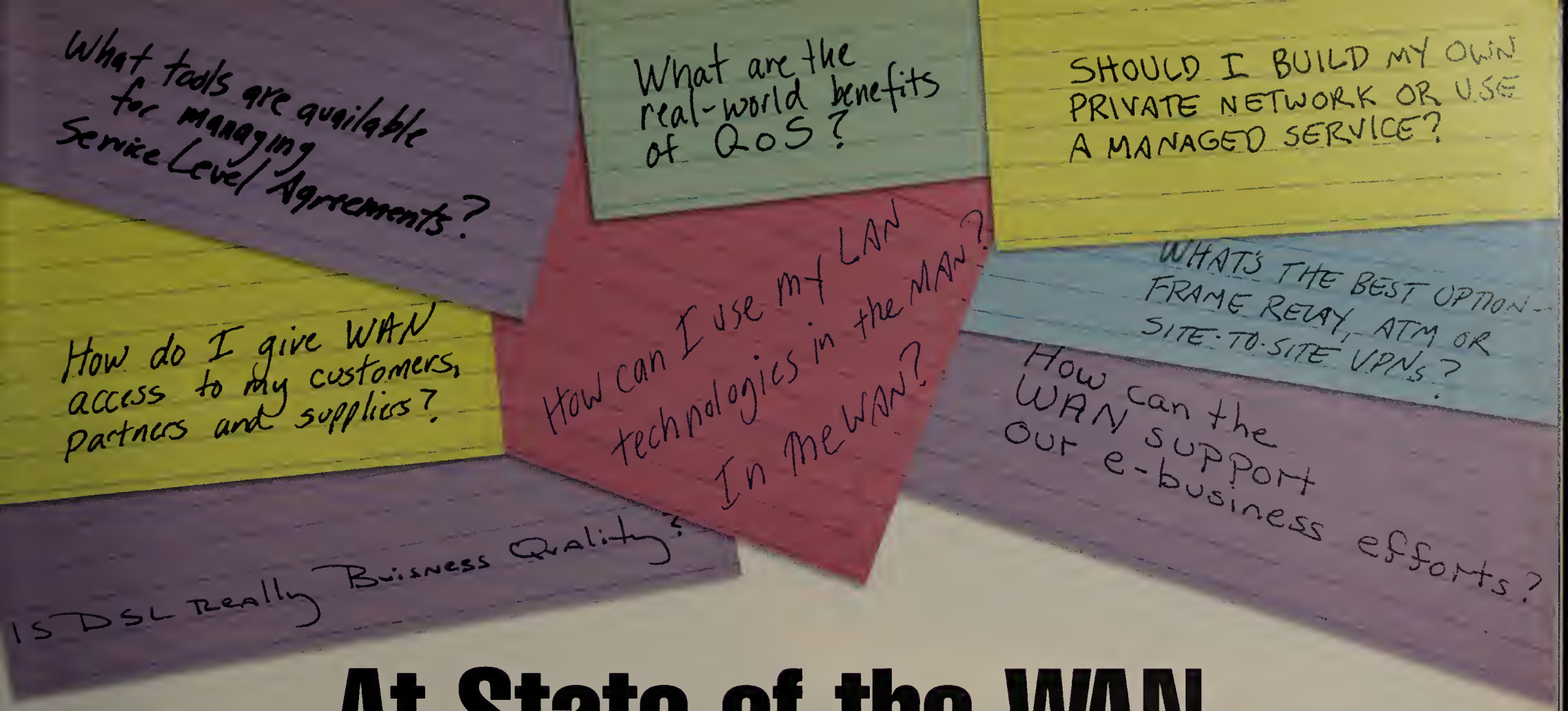

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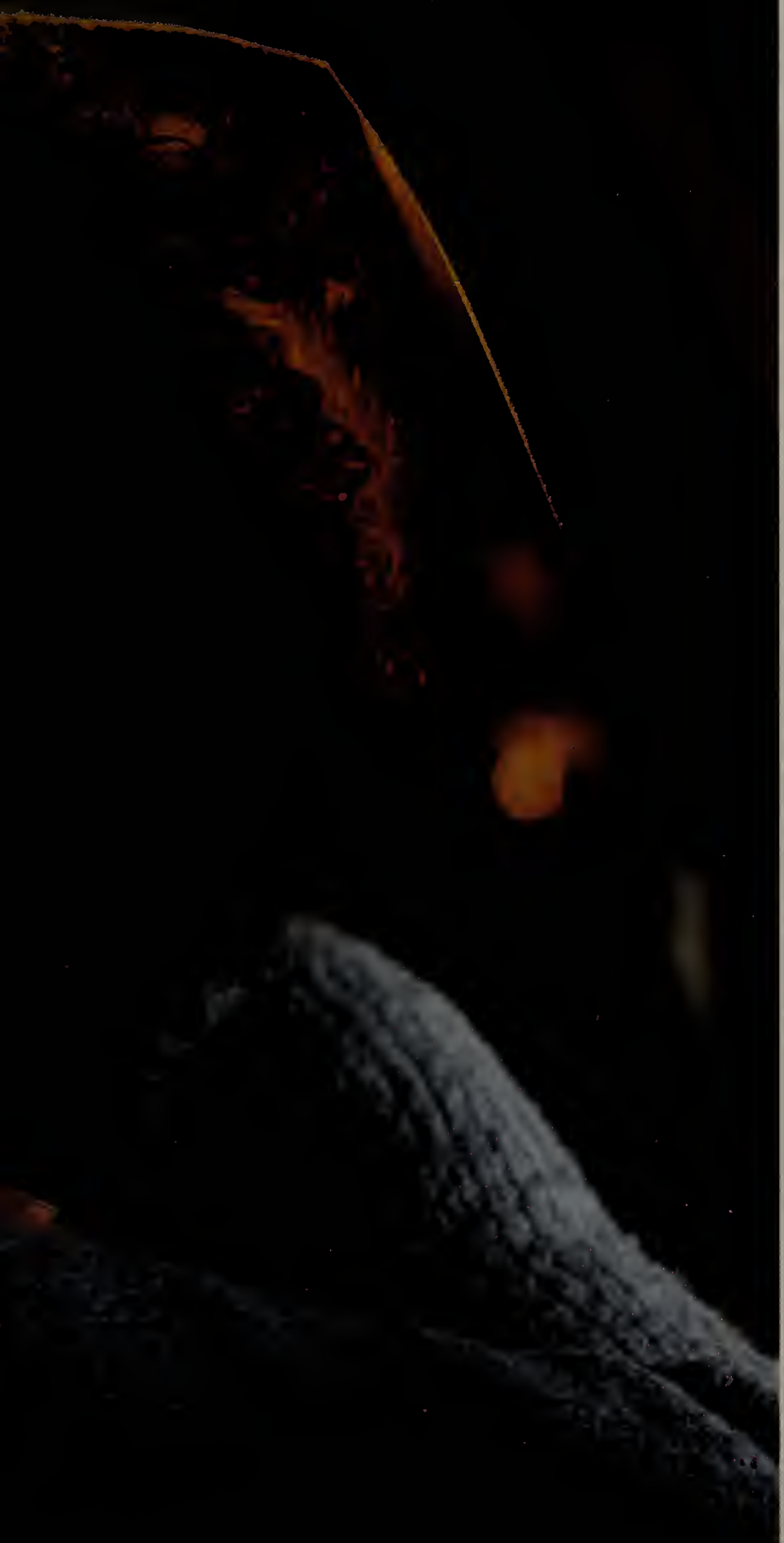

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CONNECTING PEOPLE

Motive,
continued from page 47

dent of e-business at Motive, says online customer service must be built into e-business applications, not provided separately via e-mail or telephone. "For complex e-business applications, Web-ified call centers are not working," Maples says. "It doesn't matter if you've designed the best e-business application in the world if it doesn't have customer care wired in."

Specific components include registration assistance, transaction assistance, technical assistance and account assistance. The components were designed during integration projects with Motive's existing customers including Merrill Lynch, Adelphia and UPS.

Olympus is available free with an existing services contract.

Motive: www.motive.com

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Novadigm,
continued from page 47

tem information, such as software versions or applications running on the mobile device, while it is connected to the net. The next time the mobile user dials in, Radia Inventory Manager will compare the more recent system information with the stored data and update the remote user's device with new software to keep the machine current.

Radia Inventory Manager also lets users see the speed of their connections and how much bandwidth is available, and then control the amount of bandwidth the system uses for downloads.

Pete Janssen, senior systems engineer at e-commerce products and services provider Commerce One, says many companies offer software distribution products, but few let users "throttle deployment based on bandwidth." Commerce One considered about a dozen inventory management products, but Janssen says the company chose Novadigm's offering because of its integration with other systems and its automated features.

Users can also restore their systems remotely without help from IT staff. When the IT staff sets up a laptop or installs software on a mobile device, Inventory Manager records the configuration of software, applications, utilities and memory on the device. If a user downloads new software to his laptop and it causes problems, he can click an icon on his desktop, and the system will undo the actions and restore the system.

Commerce One has been using Novadigm's product for about two months, but Janssen says he expects to see a four-fold return on the firm's investment in Radia Inventory Manager: "It gives us an accurate count of our licenses so we don't over or underbuy."

Radia Inventory Manager comes with Radia configuration and integration servers, which run on Windows NT and 2000, Sun Solaris, HP/UX, and Red Hat and Debian Linux. On the client side, Inventory Manager supports Windows 95,98, NT and 2000. Available now, it costs $50 per client.

Novadigm: www.novadigm.com

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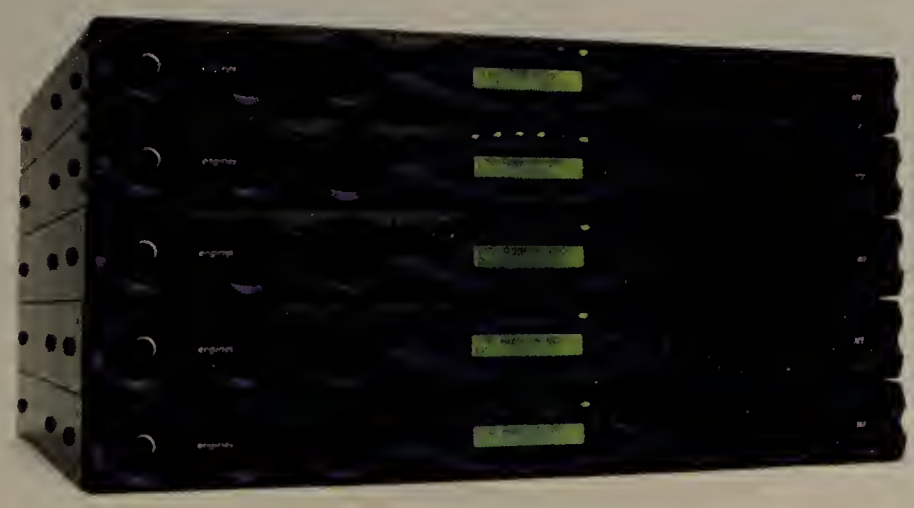
IT HARDLY SEEMS FAIR.



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'Net Insider . Scott Bradner

THE IMPORTANCE OF GETTING LOST

I was reading an article in some random mass media magazine the other day that went on and on about how hard it was going to be in the future to get lost. Global positioning satellite systems in cars, cell phones and soon, wrist watches, will let us know at all times where we are.

My immediate reaction was one of dread. Getting lost is a two-way street. If you don't know where you are, then you can claim to be lost.

Also, if you cannot be found, whoever is looking for you sees you as lost. I don't like the implication of either meaning.

I've written often in this column about my unease at the growing ability of everybody and their brother being able to track your every movement. Getting a page to tell me that there is a Starbucks two doors down on the left in the direction I'm going is not my idea of fun. Nor is the idea that the phone company is keeping a record of wherever you roam — a record that can be turned over to the authorities on request. Sure it would be easier for the cops to have a record of everyone's movements, but is there anything left to the individual in that kind of world?

To me, the other meaning of getting lost is almost as important. In the physical world, never getting lost means never seeing most of what is around you. Other than worrying about running out of gas, the best way to discover is to wander.

This is also true in the world of invention. Clearly some types of invention, such as the "invention" of the electric light, are best done by repeated trials of slightly differing components. Thomas Edison was said to have tried thousands of different materials for the filament in his light bulb before finding one that would last.

But in many other cases you can't get there that way.

Some traditional standards organizations seem to think that you can even plan innovation.

The International Telecommunication Union (ITU) has a quadrennial meeting during which it plans what standards it is going to work on over the next four years.The ITU is trying to be more flexible, but the quadrennial meeting is still a fixture.

This mode of operation helped ensure the steady, if unimpressive, development of telephone technology. But it did not produce the Internet.

Getting lost in thought is still the best way to find something you didn't know was there. Coming around a mental corner and finding a new way to look at a problem is just as exciting as coming around a physical corner and finding an unexpected vista.

I think I'll keep letting myself get lost from time to time.

Disclaimer: Harvard has gotten lost many times in 360 years and has developed a nice map collection, but the above vista seeking is mine.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

Our stand-alone Windows 2000 SR1 server runs Routing and Remote Access Services (RRAS). Our VPN clients can connect to the machine and use the shared directories. However, they can't use the Web or e-mail while connected to the VPN. The server assigns IP addresses to the clients from a static pool we set up. We verified the TCP/IP settings on the client side using "ipconfig /all" after users connect to the VPN. It shows the correct IP address, gateway and Domain Name System information. Clients can ping the RRAS server, and we can ping the clients from the server. A note: We can't ping one VPN client from another VPN client through the server.

You have to enable IP routing on the RRAS server. Open the RRAS snap-in and expand the RRAS server entry in the console tree. Through the action menu under properties, make sure the IP routing box is checked. Go back to the console tree, click on routing interfaces and make sure your LAN connection is shown as a routing interface. Make sure the "Entire Network" option is selected for LAN protocols being used by the VPN clients as well. Finally, check that the router(s) on your intranet know that your VPN clients are on the far side of your RRAS server. Without a route back to your VPN clients via the RRAS server, your mail and Web servers won't be able to send packets back through the VPN.

Blass is a network architect at Sprint Enterprise Services in Houston. He can be reached at dr.intranet@paranet.com.

Storage over the Internet — iSCSI emerges

BY BRENT ROSS

Storage is an essential part of any company's infrastructure. Rapidly increasing storage capacities and network speeds challenge storage system performance, whether it's at the enterprise level or below. IP storage — sending block-level data over an IP network — addresses the requirements of a range of environments from single server to computer room, Internet data center, campus and WAN.

The Internet Engineering Task Force (IETF) is currently considering two approaches to transmitting storage data over IP networks. Tunneling translates Fibre Channel control codes and data into IP packets for transport from one Fibre Channel storage-area network to another remote Fibre Channel SAN. Storage tunneling assumes the use of Fibre Channel technology.

The other approach is IP storage, known as iSCSI, which transmits native SCSI over a layer of the IP stack. ISCSI will let a corporate network transfer and store SCSI commands and data at any location with access to the WAN or, if transmitted over the Internet, to locations with access to the Internet. It will also allow smaller localized SANs to be built using the common Ethernet infrastructure. Hence, iSCSI enables SANs to be implemented by a broad, mainstream market.

SCSI is a commonly used industry standard protocol for storage devices. Using the SCSI protocol, drive control commands and data are sent to the drives. Responses and status messages, as well as data read from the devices, are passed through SCSI controllers.

In a system supporting iSCSI, a user or software application issues a command to store or retrieve data on a SCSI storage device. The request is processed by the operating system and is converted to one or more SCSI commands that are then passed to software or to a card. The command and data are encapsulated by representing them as a serial string of bytes proceeded by iSCSI headers. The encapsulated data is then passed to a TCP/IP layer that breaks it into packets suitable for transfer over the network. If required, the encapsulated data can also be encrypted for transfer over an insecure network.

The packets are sent over the network or the Internet. At the receiving storage controller, the packets are recombined and, if necessary, decrypted into the original encapsulated SCSI commands and data. The storage controller then uses the iSCSI headers to send the SCSI control commands and data to the appropriate drive, which performs the functions that were requested by the original computer or application.

If a request for data has been sent, the data is retrieved from the drive, encapsulated and returned to the requesting computer. The entire process is transparent to the user.

Although the SCSI commands and data preparation can be accomplished through software using standard TCP/IP and off-the-shelf network interface cards, a more likely scenario will involve specialty iSCSI interface cards that will perform this function. In a scenario that involves encapsulation, decapsulation and TCP/IP through software, performing these functions on the host processor requires many CPU cycles to process the data and SCSI commands. By moving these functions to specialty hardware, impact on system performance can be minimized.

An initial draft of the iSCSI standard and early iSCSI products are expected during the first half of 2001. This month, companies participating in the IETF's standards development will meet with the goal of advancing progress toward a standardized method of transferring data and SCSI commands between computers and storage devices, using IP networks.

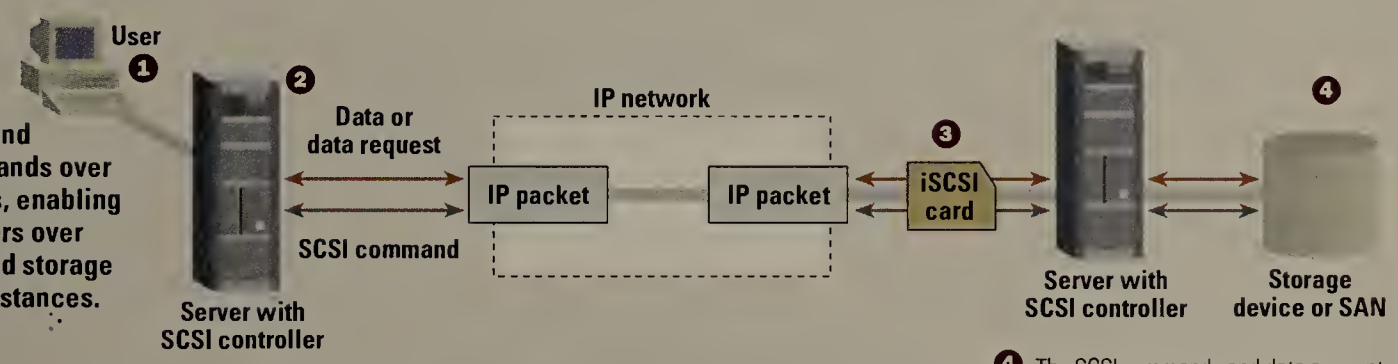
The pervasiveness of IP networks will let data be moved over LANs, WANs or across the Internet using this new IP storage protocol.

Ross is marketing manager of IP storage products at Adaptec. He can be reached at brent_ross@adaptec.com.

HOW IT WORKS

iSCSI

ISCSI will carry data and SCSI commands over IP networks, enabling data transfers over intranets and storage over long distances.



1. An application or user issues a request for data, a file or an application. The operating system generates the SCSI commands and data request.
2. The command and request are encapsulated and, if necessary, encrypted, and a packet header is added. The packets are transmitted over an Ethernet connection.
3. At the receiving end, the packet is disassembled or, if it was originally encrypted, the packet is decrypted, separating the SCSI commands and the request.
4. The SCSI commands and data are sent to the SCSI controller, and from the SCSI controller to the SCSI storage device. Similarly, data can be returned in response to the request using the same protocol. ISCSI is designed to be bidirectional.

Got great ideas?

***Network World* is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Mark Brownstein, Technology Editor (mbrownstein@nww.com).**

Gearhead . inside the network machine . Mark Gibbs

LOOKING OUT FOR SCANS

A couple of weeks ago (www.nwfusion. com, DocFinder: 2037) we apologized for misprinting a URL and gave, in its place, a URL that was still wrong. We are wincing at this double faux pas, and this week we offer the correct URL: ftp://www.isi.edu/in-notes/iana/assignments/port-numbers.

Another correction we need to make concerns the Windows NT version of nmap that we discussed last week (www.nwfusion.com, DocFinder: 2036). Reader f@d3r (obviously not his real name) commented, "Your column says that there are a few limitations. This is incorrect. The program is/was a publicity stunt by eEye. Try to actually use the program. Foundstone provides a much better command-line port scanner."

F@d3r is correct about using the program — our comment that the limitations weren't anything you couldn't live with were based on the documentation provided by eEye.

A couple of days after writing the column, we tried to run the program but we got missing Dynamic Link Library calls and apparently wrong DLL versions. We gave up. If anyone at eEye reads this, let's exchange messages and find out how to get nmap-NT working.

Be that as it may, f@d3r's recommendation of tools from Foundstone is an excellent one. On the Foundstone site you will find some interesting tools (www.foundstone.com/resources/tools.html), and they are all free.

Attacker (www.foundstone.com/resources/attacker.html) is a port listener that acts like a watchdog. Whenever a connection is made to a port, Attacker displays the source IP address and port, and the destination port. Attacker also can alert you with a sound — the default is a klaxon but we substituted a bark (http://dogpatch.org/sounds/bark.wav) instead.

The tool that f@d3r alludes to is Fscan (www.foundstone.com/resources/fscanbeta.html), a command-line port scanner that has more than a little hacker quality to it. For example, Fscan can be instructed to randomize the order in which ports are scanned — a feature that is only there to make detection of being scanned harder — and there's an option to suppress pings (usually sent before scanning to see if the destination is actually there — when your subnet is pinged in sequence, it is a dead giveaway that someone, somewhere is up to no good). Fscan can also run multithreaded (up to 256 threads under NT but only 20 under Windows 9X). Definitely cool.

We also liked Foundstone's Superscan (www.foundstone.com/resources/superscan.html) — essentially Fscan with a windowed user interface. Superscan provides a nice display of its results in a hierarchical tree.

Foundstone's free tools are extremely impressive. They get a Gearhead Legion of Honor award.

Finally, an important configuration issue with Superscan is which ports are to be scanned. We strongly recommend that you enable all ports and then scan all of your own network — you may be surprised at what you find.

We just found that our NT server appears to have Back Orifice installed . . . guess what we'll be writing about next week?

Tell us your Back Orifice stories at gearhead@gibbs.com.

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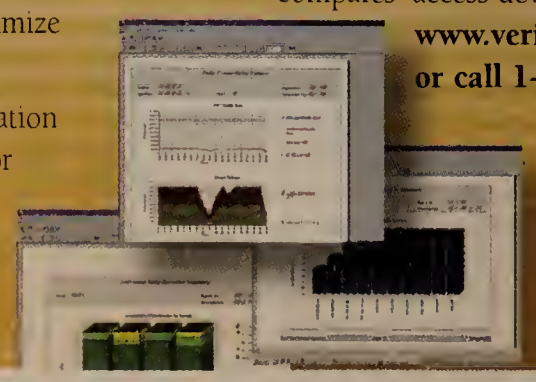

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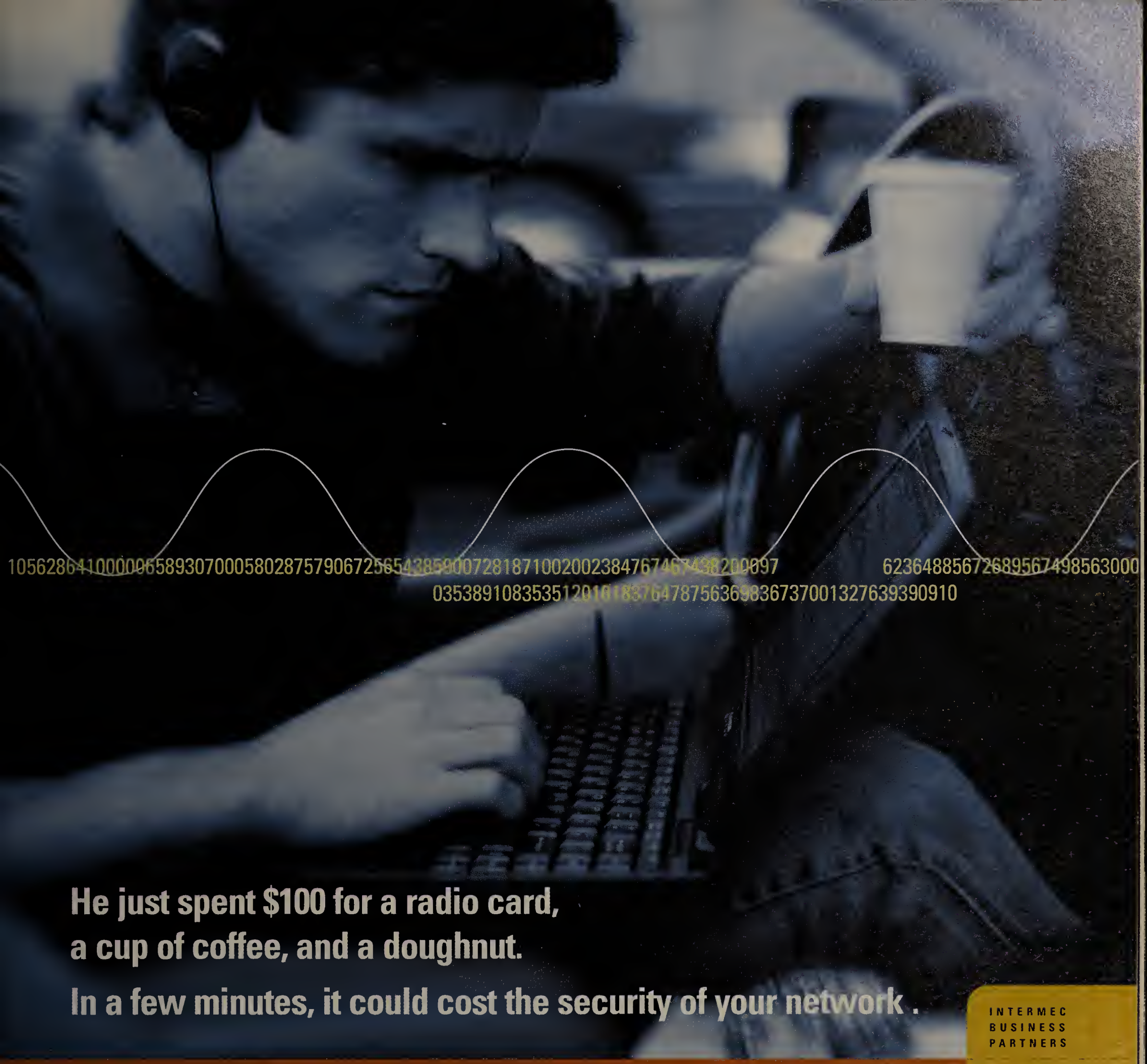

He just spent $100 for a radio card, a cup of coffee, and a doughnut.

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Editorial

Facts and figures about our wired nation

I've been reading the U.S. Department of Commerce's fourth report in its "Falling Through the 'Net" series of studies about the digital divide, and it's jampacked with interesting facts.

The upshot is that all Americans are flocking to the Internet, regardless of income and ethnicity, even though a significant gap remains. Without getting into the quagmire of whether that is expected/OK/surprising/bad, here are the facts I find most interesting:

- The number of households with Internet access has jumped 58%, from 26.2% in December 1998 to 41.5% in August 2000.
- Half of all households (51%) now have computers, vs. 42.1% in 1998.
- More than 44% of all individuals use the Internet today, compared with 32.7% in 1998. The Commerce Department says, at that rate, "more than half of all Americans will be using the Internet by the middle of 2001."
- Although Internet penetration is significantly lower in low-income households, these households are installing Internet links faster than more affluent families. Only 12.7% of households with income of less than $15,000 use the Internet, but that's up 79% from 1998. Even larger gains were reported for households earning $15,000 to $24,999 and $25,000 to $34,999 — 93% and 78%, respectively. By comparison, Internet use in households earning more than $75,000 grew 29%.
- Analyzing Internet penetration by race shows Asian Americans and Pacific Islanders are the most connected at 56.8% of households, followed by whites at 46.1%, Hispanics at 23.6% and blacks at 23.5%. But almost the inverse is true for adoption rates. Internet adoption grew 110% from 1998 to 2000 for blacks, 87% for Hispanics, 58% for Asian Americans/Pacific Islanders and 55% for whites.
- People older than 50 use the Internet less than 9- to 17-year-olds — 29.6% vs. 53.4% — but the 50-and-older bracket has the highest rate of growth among all age brackets at 53%.

The government also asked for the first time about broadband access. Only 10.7% of the households have broadband today. Of that, 50.8% use cable modems, 33.7% use DSL, 4.6% use satellite and the remainder use ISDN and other technologies.

Regardless of your take on the digital divide, it is amazing how fast the U.S. is getting wired.

— John Dix
Editor in chief
jdix@nww.com

Message Queue

JUSTIFY THE BENEFITS

The article "Virtual routers open up new services" (www.nwfusion.com, DocFinder: 1943) speaks of all the benefits of virtual routers without justifying any of them. Virtual routers are just part of the answer. By isolating resources, you are diminishing or negating economies of scale. Besides, every major routing manufacturer around already does some variation of this in conjunction with shared resources and hardware optimization. Why don't we all go back to routing by using a Unix server with multiple network interface cards? That's what's being described. What a backward move. This article was well written, but full of worthless marketing with little technical merit.

Michael McCarthy
Concord, Calif.

WAN STORAGE TODAY

Regarding your white paper "Storage networks: A place for everything" (www.nwfusion.com, DocFinder: 1944):

There are already distributed storage-area networks (SAN) over the wide area. They're called VMS clusters, members of which can be as distant as your high-speed WAN can take them. Shadowing via software (Raid zero) is efficient. Network File System-mount the VMS disks (for use by Unix), or make Windows NT containers on the VMS volumes and *voila* — there's your distributed SAN.

Craig Paul
Technical support programmer/analyst IV
Kansas University Computer Center
Lawrence, Kan.

THE MEANING OF TRUST

Regarding the article "PKI enables digital signatures" (www.nwfusion.com, DocFinder: 1945):

There are many perspectives on the underpinnings of trust on the Internet. Perhaps the most recognized perspectives can be characterized as the pecuniary and security views. In the pecuniary view, trust is a function of the extent to which a promisor can "back up a promise," pay damages and guarantee one's performance. In the security view, trust is a function of the extent to which a promisor has deployed reliable security services and has responded effectively to the attendant risks.

In the pecuniary view, there is no doubt that money talks. But without security, there is no protection against becoming a victim. The pecuniary view may only provide financial recovery following injury.

But there is a third dimension to the provision of effective trust over the Internet — a dimension that derives from the notion of "trust but verify." Such verification is a function of assessment and accreditation.

Assessment refers to a procedure for determining whether a system or subelement — public-key infrastructure or a PKI component, for instance — satisfies a set of defined criteria. Generally, the goals of PKI assessment are ultimately intended to provide assurances of trustworthiness and quality. Meaningful and efficient PKI assessment is best facilitated if the number of assessment methodologies are limited to no more than a few widely recognized models. The challenge is to ensure that the assessment models are responsive to the targets of such assessments.

Michael S. Baum
Vice president of practices and external affairs
VeriSign
Mountain View, Calif.

INTERNET VOTING

Regarding your Face-off on whether Internet voting is fair (www.nwfusion.com, DocFinder: 1946)

Using Secure Sockets Layer or some form of Secure Encryption Technology would ensure security, but is there a control mechanism to ensure the integrity of the votes, as far as one vote per U.S. citizen?

Internet voting could be expedient and feasible. A computer could be used at the polling places, letting voters merely click on one candidate's name. The voters would first register with the judge of elections, who would be the one to screen them and assign the legal voters access to their single vote. Any computer could be set up for this purpose, so the cost would be nominal.

Gloria Perri
Philadelphia

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*

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MORE ONLINE

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Telecom Catalyst . Daniel Briere and Beth Gage

More names we love to hate and hate to love

Our last column on names generated so many responses we had to do more. Apparently, when naming companies, some people can't stay away from what they saw the night before.

GotOffice.com? Gotspeed.com? Who names a company after a milk commercial? Trendy corporate identities will fall off as soon as the theme does.

XO Communications? Did this come from ESPN or the Romance Channel? Is this a hugs-and-kisses company? Or maybe it will explain its products like a football play with John Madden as the spokesperson.

Yipes, Yahoo, Boo, Ouch, Pow, Smack, Crash, Bang. These companies are named after sounds in Toon-Town. It's like watching fight scenes from Batman.

Then there are the "Jerry Springer Show" knockoffs, such as F***edCompany.com. Do we really need to have companies named in expletives?

Don't forget the reruns. If you can't think of a new name, go back and see what's lying around the closet. Like Concert — used at least three times by WorldCom, er, MCI, er British Telecom, er whatever. It's synonymous with anything with a lot of hype and never delivering. Why reuse it?

We hate to see great brands bite the dust because of mergers. Some names should go: See ya, Nynex. Others, such as Concentric Network, are strong brands. When you run multimillion-dollar ads telling customers, "We are the same, only with a new name" — don't you question why you changed the name?

Don't let the ad agencies push you around. Hold out for a good name that you will be proud to tell someone at a party. Some of the names we like:

- CoreExpress: Expresses data across an Internet core with guaranteed delivery and message tracking.
- Simplexity.com: Bringing simplicity to the complex world of buying telecom services.
- Mantra: Conveys a sense of knowledge, understanding, and peace of mind.
- BroadBand Office: Targeting businesses with broadband services.
- AirNet Communications: Provides high-speed optical networking through thin air.
- @Home: Provides broadband services into the home.
- Efficient Networks: Focuses on squeezing as much capacity as possible out of networks.
- Global Crossing: Building new fiber networks across the globe.
- Exodus: Moving content and applications out of the corporate data center.
- GoAmerica: Mobile provider.
- Visual Networks: Giving you visibility into your network.
- WorldCom: The name says it all, and it's trying to take over the world — one acquisition at a time.
- NetScreen: Conveys network security effectively and has the high-tech feel of splicing two words together.

Want creative names? Throw us some stock options, and we'll save you tons of money.

Briere is CEO and Gage is vice president of TeleChoice, a market strategy consultancy for the telecommunications industry. They can be reached at telecomcatalyst@telechoice.com.

On Security . Winn Schwartau

Honeypots wreak sweet revenge against cyber intruders

In the world of warfare, the term "asymmetry" means that one adversary isn't playing by the rules. Recently, some colonels in Beijing took a staunch asymmetrical position against the U.S., effectively declaring unrestricted war on our networks. Essentially, their message was, "Since the U.S. can beat us with conventional and nuclear weapons in any kinetic/physical conflict, we in China hereby declare the U.S. economy, private sector and critical infrastructures to be legitimate targets."

Infowar-ish events, spurred by world politico-religious discontent, only exacerbate a network manager's natural security concerns. Who is that knocking at your door? Is it the kid next door sport-hacking, or a national assault against your e-commerce site or communications infrastructure?

The technology to identify the "bad guys" is finally getting somewhat better than the old-fashioned static intrusion-detection systems. Emerging technologies are looking more at the dynamic behavior of electronic visitors to determine, with varying degrees of accuracy, who is a good guy (buyer/customer) and who is a bad guy (use your own definition for that).

One of these emerging technologies is called a deception system, or honeypot. Security expert Robert Graham defines a honeypot as a system designed to look like something an intruder can hack. (For Graham's intrusion-detection system FAQ, which includes a good overview of honeypots, go to www.robertgraham.com/pubs/network-intrusion-detection.html.)

Ancient military leaders had horses pull logs to generate large amounts of dust to convince their adversaries that massive amounts of troops were on the way to battle. During World War II, the Department of the Army painted the roofs of military-related buildings to look innocuous and civilian.

FRANCIS BLAKE

Translating these premises to networks is conceptually simple. One way is to add a dedicated deception server with the sole purpose of looking like a proverbial honeypot or cookie jar to people with hostile intent.

When the bad guys get sucked into the honeypot, they are no longer in or near your critical systems. Also, you can monitor their activities more closely, examine attack techniques and possibly trace back to identify the attacker.

One of the more popular locations for deception devices is inside the network, as a means of handling attacks from disgruntled employees and other malicious users with legitimate network access. Logging at deception points or central servers becomes an issue, especially if any future legal action is anticipated. Logs can provide good forensic evidence for a prosecution, but the logs should be recorded to a non-modifiable media such as CD-Recording to prove that the evidence was not tampered with. Also, a cryptographic seal around the logged files makes for a stronger forensic trail.

Several recent case studies have shown that deception methods tend to keep some bad guys at arm's length because they know their actions are being monitored. Internal honeypots with names such as SAP or PeopleSoft tend to attract hits from insiders, which suggests that critical servers should be named something that does not attract attention.

It's wise to consult your human resources department before deploying internal deception systems because employee monitoring can be controversial. Companies generally have the right to monitor employees, but how this is done and what employees are told is a matter for management to decide.

While not a network security panacea, deception is another option for the security-conscious organization, especially for monitoring insider threats. Deception products are hitting the market. CyberCop-Sting from Network Associates is based on the vendor's existing technologies. ManTrap from Recourse Technologies builds deception tools, and sNET from sNET Systems provides a complete suite of deception options. Or if you're into building your own, check out www.all.net for Fred Cohen's Deception Tool Kit.

In the end, though, Winston Churchill said it best: "In war, truth is so precious, it must be protected by a bodyguard of lies." Why not try the same thing with your network?

Schwartau is president of Interpact (www.securityaware.com), a security awareness consulting firm, and the author of several books, including Cyber Shock. *He can be reached at winns@gte.net.*

STREAMING MEDIA IN THE FASTLane

Activate and Yahoo Broadcast in photo finish

BY CHRISTINE PEREY

STREAMING MEDIA is more than just listening to music, watching a movie trailer or funky animation. It's also an underlying set of technologies that can help your company communicate more effectively, more consistently and more conveniently with employees, partners, resellers, prospects and customers.

When streaming media was new, early adopters installed it in isolated networks and tested internal applications with small numbers of users. In the past four years, streaming media usage has soared. RealNetworks reports that more than 150 million users have registered their client software applications, and thousands of consumer and corporate sites post new content daily.

As the number of users, applications and demands for business-quality streaming experiences increases, companies may want to outsource parts or all of their streaming media to content delivery networks. When to outsource your streaming media application and network management is the first question you should ask (see Chart 1, page 65). Businesses most likely to benefit from outsourcing are those in which the target audience is physically dispersed and logically separated from the network on which content (live or on demand) originates. Businesses that have periodic live-event broadcasts for large (more than 1,000 desktops) internal audiences, in which the application requirements exceed the data network's capabilities, are also better off outsourcing than attempting to deploy internally.

To determine which streaming media provider is the best depends on your company's size and needs. Assuming that we were working on behalf of a large company with a set of conventional applications, we developed what we believed a service provider would need to meet these demands. The ideal provider has to be successful in four technical arenas: multimedia application services platform; network access and transport; data center facilities and hardware; and intelligent software for streaming media delivery and network management. The company should also stand out in three business areas: customer lifecycle service; pricing; and corporate and product management.

We narrowed the field of vendors from 60 down to nine (see "Race ground rules," page 72). From those finalists, Activate, Digital Island, iBeam and Yahoo Broadcast accepted the ground rules of the "race" and made it to the finish line. AT&T, Enron, Globix and Intel declined our invitation because of a shortage of internal resources to dedicate to the project. Akamai started the race, but dropped out. (see "What about Akamai?" page 70).

Activate, Yahoo each win Blue Ribbons

We conducted two studies in tandem. We looked for the best provider of live-event broadcasting services, and the best for on-demand applications (hosting, content delivery and management). Yahoo Broadcast wins the Blue Ribbon Award for live-event broadcasting services, with Activate coming in a close second.

Activate wins the Blue Ribbon Award for the on-demand portion of the shootout, but likewise, Yahoo Broadcast was only a split second behind the winner.

We were impressed with Yahoo's account management team, the

WARNING!

THE RESULTS OF THIS STUDY REVEAL only the conditions experienced by the study team, and the networks' conditions in 10 metropolitan areas as of September and October 2000. Although massive improvements in a provider's customer service centers, pricing, and corporate and product management are unlikely in the course of a few months, the technical capabilities (access to high-bandwidth, low-latency networks, data centers and sophisticated streaming media network management software) can advance rapidly. We believe our findings are accurate, but encourage our readers to repeat the study for themselves before signing a multiyear commitment with any streaming media network service provider. In other words, your results may vary depending on the applications you have and the network conditions within the company, the service provider infrastructure and your target audience.

strength of its application services platform and network performance. On the on-demand side, Activate impressed us with its network performance and a well-polished proposal.

Chart 1: When should you outsource?

Type of stream situation	On demand (playback anytime)	Near real time (live broadcast)	Real-time (conferencing, no latency)
Audience, content are on a network managed by the same in-house IT group	Maybe outsource	Very likely to outsource	Maybe outsource
Audience in other businesses or remote offices	Yes, outsource	Yes, outsource	Not practical on IP end to end
Audience in consumer setting	No, unless there is broadband access to the home	No, unless there is broadband access to the home	Not practical

SOURCE: PEREY RESEARCH & CONSULTING

Start your engines: Live-event performance

We based our final score for the live event services on three sources of data: network performance; analysis of proposals submitted by the participants (see www.nwfusion.com, DocFinder: 2021); and the first-hand experience of working with the participants to plan and produce a complete live event.

We took the live-event network performance measurements on Sept. 26, from noon to 1 p.m. Eastern Daylight Time. Streaming media network operation centers received live content from the Echostar Dish Network to identically configure receivers, convert the original video to RealNetworks' G2 format and stream video and audio packets to 10 Keynote Systems-owned and managed measurement agents at 15 frame/sec using 100K bit/sec of bandwidth.

Users always seek a responsive network environment, but after the announced start time of a live event they are intensely aware that content is streaming live, whether they're watching it on their screens or not.

Unfortunately, because this was a one-time event, we could only sample one "time to start" for each of the four service providers, so this particular data subset was too small to receive significant weight in our study.

Packet loss and recovery, bandwidth usage, and frame data were considered more important than time to start in our analysis of the live-event performance data. With this said, bandwidth usage is the least important of these three because during a longer stream such as the one-hour broadcast used in this event, three equally good conditions may exist in the network. First, the streamed bandwidth remains high enough that the buffer in the network and client keeps growing until the remaining event sits in buffer until the event plays out, at which point bandwidth drops to zero. Alternately, the server may alternate between rapid buffer filling and quiescence. The third scenario is one in which the bandwidth usage is constant over the length of the event. Because these three scenarios are compatible with successful live streaming, bandwidth usage or bandwidth variation fail to be good indicators of performance.

Our live-event performance then rests most heavily on the packets lost and frames received per second (for video) data. Chart 2 (page 66) shows audio and video packets lost expressed as percentages of the total packets sent, averaged over all 10 measurement locations.

In the case of iBeam, the agent in Philadelphia caused significant anomalies in the data. When we removed the Philadelphia agent's data from iBeam's data set, its performance matched Activate. To put the video data in context, remember that roughly 20 packet/sec of video are shown (see Chart 3, page 66), so that even at the highest average of video packet loss,

only about one packet per 16 seconds is lost on average. One missing packet might noticeably damage several video frames, but on the whole, the average frame was quite unlikely to be damaged.

Video frame rate is key

The video frame rate displayed by the player was the most useful predictor of perceived quality of video. While each vendor encoded its stream at 15 frame/sec as agreed, the average frame rates experienced by all agents was higher than 15 frame/sec for all networks and differed substantially from one provider to the next. This is in part a matter of the players interpolating new frames between frames received under high-quality conditions to produce the best possible experience. The agents also experienced different rates of frames dropped. Unfortunately, it isn't possible in this data set to determine whether the network or the client was at fault for the frames dropped.

Performance data is challenging to collect and analyze. We were confident that the methodology used in this test produced the most level playing field possible and that the measurement agents captured performance metrics accurately.

We found that the Activate and Yahoo Broadcast networks were good and performed significantly better than the other networks studied. We gave Yahoo Broadcast the highest score (8.5 out of 10) because the network introduced the lowest errors and the fastest initial buffering on the stream (6.7 seconds). Overall, we found Activate and Yahoo Broadcast networks more than adequate, but believe there remains room for improvement.

Lap 50: RFP responses

A customer's first impression of a service provider often comes through contact with a salesperson. Following the introductions, a full-length request for proposal (RFP) that describes the company's goals for streaming media should be submitted to at least three service providers. Responses to RFPs should be prompt, complete and emphasize how a company's strengths match your company's needs.

We submitted two separate scenarios and asked the participants to submit RFPs. Each proposal was evaluated on completeness in addressing key areas of concern, such as the application services platform, network infrastructure/architecture, streaming media management technologies, and business issues such as pricing and service-level agreements (SLA).

With the exception of Digital Island (whose proposals were received late and were deficient in a number of areas), the proposals submitted to us met or exceeded our expectations.

Activate's proposal was well-written, well-formatted and gracefully highlighted the company's strengths, such as its international reach and number of strategic alliances. Partners include backbone providers and complementary technology providers, such as Senata.com for attendee invitations, and Engage for advertisement insertion capabilities. Although network-monitoring practices were well explained, the proposal did not have a sample SLA as requested.

Digital Island's proposal was informally written, and while it covered the network architecture in detail, there was an assumption that the customer would need numerous supporting documents that further described the network's performance.

One of the important supporting files we found above average was Digital Island's sample SLA. It contained extensive detail and specifics about the consequences of the service provider's failure to meet service-level standards.

The last section on pricing offered us too much depth. Fortunately, the company's response included a separate pricing summary, but we don't believe the price differed sufficiently from competitors to overcome the weaknesses of its proposal.

IBeam's response was well-written and well-formatted, and covered many subjects in appropriate detail. The comprehensive explanations of the network architecture were helpful in understanding the company's ability to circumvent the Internet for high-quality content delivery.

We were also impressed with the capacity of the company's infrastructure (It has the ability to serve 500,000 simultaneous users) and complete application services platform.

The pricing tool was complicated, but well-summarized in the proposal.

Yahoo Broadcast's proposal was pleasing to the eye and easy to read. It responded to all topics of interest comprehensively and added value in many places. In particular, this proposal went above and beyond simply responding to the RFP's questions — it demonstrated that the sales team could use many of the parent company's assets, such as special interest mailing lists, to expand audiences. According to the company's proposal, its current capacity exceeds one million simultaneous viewers, making it the largest of the networks tested.

Reporting was explained in depth, while pricing followed a simple formula. Having seen complex and simple price quotes, we believed the proposal should give a simple formula and it is the customer's responsibility to ask for details if the proposal does not sufficiently explain pricing.

Lap 200: First-hand experiences

The most demanding element of the live-event broadcasting was first-hand assessments of each service provider's customer service staff, including event producers, content acquisition engineers and the application services platforms. We made detailed observations on these points during the event preparation phase the day of the event and in the hours and days following the broadcast.

Activate and Yahoo Broadcast received nearly the same final score in this portion. The two demonstrated mastery of the pre-event phase and performed well during the events, but excelled in different aspects. Both companies had well-prepared and proven approaches (for example, an interview with the customer/presenter using a scripted work order input form) to understanding the specific event requirements. The invitations to the event were sent in an orderly fashion in both cases. While we found the Senata.com system for audience management attractive at first blush, it required an extra step before registration with the Activate application server (actually the Mshow.com engine) could begin. The Yahoo Broadcast guest registration and audi-

See **Review**, page 68

Chart 2: Live-event performance data

Vendor	Audio packets % lost	Audio packets % recovered	Video packets % lost	Video packets % recovered
Activate	0.02	0	0.01	0
Digital Island	0.13	0.47	0.09	0.32
iBeam	0.27	0	0.28	0.04
excluding Philadelphia	0.02		0.02	
Yahoo Broadcast	0.004	0.07	0.006	0.12

SOURCE: KEYNOTE SYSTEMS (NOTE: VENDORS LISTED ALPHABETICALLY)

Chart 3: Rendered frame/sec

Vendor	Rendered frame/sec
Activate	26.9
Digital Island	16.6
IBEAM	17.5
Yahoo Broadcast	26.7

SOURCE: KEYNOTE SYSTEMS

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Continued from page 66

ence capture was methodical and clear. The Yahoo team had the registration and pre-event site mocked up using the Percy.com look and feel, and approved more quickly and professionally than any other provider through this stage. This indicated a tighter integration between Yahoo's design team and event management.

Activate's and Yahoo's producers were relaxed and made the arrangements seem commonplace. During the event, everything went as planned. On-screen interactivity was supported and responsive in both cases. After the event, Yahoo Broadcast sent a thank you e-mail to the participants, as requested. Both these application services platforms had the most robust reporting tools of the five we saw, for real-time view during the event, as well as historical data.

Yahoo Broadcast finished with a narrow lead over Activate because it was evident that all of the components of the applications service platform, including audience acquisition, management, slide synchronization and reporting tools, were in-house, tightly integrated and well-managed.

Digital Island performed well in the pre-event phase, demonstrating a high level of customer contact during technology testing, requesting adjustments to lights and other local environmental factors to improve the quality of the signal acquisition. In general, the team appeared less likely to direct and was more likely to follow the customer's lead. The design of the interface seemed less familiar to the production team, perhaps indicating a need for more in-house competencies in this area.

While Digital Island's inclination to follow more than lead works for an experienced presenter, it could reduce a novice presenter's sense of confidence. The run of show developed prior to the event and the producer's persistent contact with the presenter's location via telephone ensured that once live, everything went smoothly. The post-event report was limited compared to other platforms, and did not match the ones offered in the written proposal.

IBeam's event producers seemed comfortable with every stage of the production. The pre-event orientation was casual, but unfortunately, the guest registration page was repeatedly found to have broken code. There was never a request for pre-event audio testing, although we did test connectivity and video signal acquisition 24 hours prior to the live event. For reasons that remain unclear, the presenter is required to run ICQ client software. We were told that this was the best way to obtain the results of polls in real time. We repeatedly asked for a tour of its "Dashboard" application, and were deflected each time. Finally, during the post-event debriefing, it was made clear that the application used by producers is highly customizable and tailored for repeat customers on a case-by-case basis. For reports, we were disappointed to learn that the reporting system was being overhauled and was not available for viewing. Shortly after the event, we received an Excel spreadsheet with a limited data set.

Scorecard

Live event	Performance (30%)	Proposals (30%)	First hand (40%)	Total score
Yahoo Broadcast	8.5	8	8.0	**8.2**
Activate	8	8	7.5	**7.8**
iBeam	5	8	6.0	**6.3**
Digital Island	3	4	7.0	**4.9**

Key: Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. Scoring key: 10 — Can't be better; 9-8 — Excellent; 7 — Very good; 6-5 — Average; 4-2; Needs improvement; 1 — Not supported or doesn't work.

Live-event finish line

Having three components to measure let us assess the technical and business qualities of these vendors. All were certainly prepared to host and stream our live performance content, and had ample expertise and tools to produce routine live events (live event first hand). As the number and complexity of events increases in the near future, the bets are on the top two contenders because they have standardized their procedures, and automated processes where possible. In our experience, Yahoo Broadcast is the furthest in this process and earned the score of 8.2. And although it is integrating the technologies of third parties in its service, Activate is not far behind and received a 7.8.

Next race

On-demand services

Our on-demand testing score was based equally on the performance metrics and our analysis of participant proposals. For the performance measurement portion, we solicited the assistance of two companies: WatchIT.com produced original content, and Streamriver Networks, a division of Media100, encoded the stream in two file formats (RealNetworks and Windows Media Technologies) at 40K bit/sec, 100K bit/sec and 300K bit/sec. The participants were asked to host six identical files in their networks and provide us with the URLs. Keynote Systems measurement computers requested the files from the URLs in each network and streamed them while sampling data one time per hour for 14 days, for a total sample of 336 datastreams per network.

Revving up: On-demand performance

We analyzed the data collected and based our scores on four parameters: the start-up time (seconds); the percentage of clips that had rebuffering delays; the average length of rebuffering delay per clip (seconds); and the consistency of packet delivery (packet performance).

Surprisingly, the time to start did not vary significantly for higher bandwidth data. In contrast, we were not surprised that, in general, the times were lower (faster) than for the live event broadcast because in on-demand scenarios, the server has the ability to customize the buffering conditions it sends to a particular client. In this data set, we found that iBeam consistently had the lowest start-up time (see Chart 4, page 70).

During a file's playback, if the network introduces a significant period of time when the player does not detect data, the server and client negotiate to refill the local computer's frame buffer. The effect on the user's experience is detrimental because there is a pause of variable length during which there is a blank window or the last full frame received is frozen in the window. The percentage of clips that had rebuffering delays hurt the performance of Digital Island and iBeam (see Chart 5, page 70).

Next, we observed the average length of rebuffering delay per clip. These delays are averaged over

See **Review**, page 70

www.nwfusion.com

FUEL UP

Race over to Network World Fusion for more details and data regarding our streaming media study, including:

- A guide to measuring streaming media performance.
- Our original test plan.
- Further requirements of the participants.
- A database of streaming providers.
- An example of a worksheet for evaluating a provider.
- Network architecture.
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Continued from page 68

those clips that had delays. So if 50% of clips had a rebuffering delay of 10 seconds, we would report 10s, not the average rebuffering delay of 5 seconds for all clips (see Chart 6, below). We found that clips on the Digital Island network took substantially longer to recover from a buffering problem, while the Activate network had the shortest average rebuffering time at two of the three data rates.

Our fourth and final assessment of the network performance was based on packet performance. This is the number of video packets received by the client per second on average at a given data rate.

At all data rates, higher is more likely to produce a better audio and video experience. We found that Digital Island and iBeam streamed fewer video packets on average than Activate and Yahoo Broadcast (Chart 7, page 72).

This is not because the stream was encoded using fewer packets (all vendors had the same files loaded), but rather because of inconsistent packet delivery, especially as measured by certain agents. This packet "thinning" was observed most dramatically in video on the Digital Island and, to a lesser degree, in the iBeam network.

These data and analyses led us to conclude that of the four participants, the Activate and Yahoo Broadcast networks would produce superior viewer experiences in on-demand applications. Activate finished only 0.5 points ahead of Yahoo Broadcast, while we gave iBeam a score of 6 and Digital Island a score of 5.

Chart 4: Start-up times, on demand

Vendor	40K bit/sec	100K bit/sec	300K bit/sec	Average
Activate	7.1	7	6	6.7
Digital Island	7.5	8.8	9.9	8.7
iBeam	6	6.1	5.8	6.0
Yahoo Broadcast	6.3	6.4	6.1	6.3

SOURCE: KEYNOTE SYSTEMS. NOTE: VENDORS LISTED ALPHABETICALLY.

Chart 5: Percentage of clips that had rebuffering delays, on demand

Vendor	40K bit/sec	100K bit/sec	300K bit/sec
Activate	0.06%	0.24%	0.18%
Digital Island	12.67%	11.97%	15.57%
iBeam	2.83%	0.29%	0.29%
Yahoo Broadcast	0.09%	0.09%	0.33%

SOURCE: KEYNOTE SYSTEMS. NOTE: VENDORS LISTED ALPHABETICALLY.

Chart 6: Length of rebuffering delay, on demand

Vendor	40K bit/sec	100K bit/sec	300K bit/sec
Activate	2.4	2.1	4.4
Digital Island	11.4	15.2	13.9
iBeam	7.5	1.6	4.6
Yahoo Broadcast	5.0	2.6	6.5

SOURCE: KEYNOTE SYSTEMS. NOTE: VENDORS LISTED ALPHABETICALLY.

Lap 450: RFP responses

The proposals we received for the on-demand RFP were similar in style and content to the live-event propos-

See **Review**, page 72

What about Akamai?

Market leader Akamai Technologies agreed to the terms of the shootout, submitted a request for proposal and participated in the live event network performance and live event first hand tests, then decided to pull out of the study, citing concerns about the accuracy of the test measurements.

Network World and Keynote Systems stand behind the methodology used, but we decided to honor Akamai's request to not be included in the study summary or Scorecard. However, we also decided to share with readers what we did learn about Akamai's service prior to its decision to withdraw.

During the one hour live event network performance test, Akamai's audio packet loss was 0.1%, and 0.08% recovered. For video packets, Akamai had a 0.13% packet loss, and 0.06% recovered. Additionally, Akamai rendered its stream at 17.5 frame/sec.

When it came to the RFPs, both of Akamai's proposals sold us on the company's capabilities and infrastructure. It scored a 9 on both, a full point above Activate and Yahoo Broadcast. We were particularly impressed with the way its proposal offered turnkey products and services to address the challenges our fictitious customers faced. In addition to clear explanations of what would be delivered and how much it would cost, the proposals contained detailed workflows, specifying what would need to happen for the customer to have a successful experience.

Akamai's proposals had a detailed description of the company's streaming technology architecture, customer service integration and clear service level agreements. During the supporting interview (following submission of the proposal), we were shown the newly released "I am Akamai" customer portal, a cornerstone of Akamai's next generation application services platform.

For the live event first hand test, Akamai brought in ACT Teleconferencing, a Denver provider and reseller of the Akamai Conference service (which is only available to third party providers). ACT's customer support staff thoroughly and professionally planned the event, including preflight tests with our videoconferencing equipment. Using the full featured Akamai Conference network and Akamai ForumPresents Plus' suite of management tools, the event should have gone flawlessly. When the rubber met the road, unanticipated audio problems compromised the user/presenter experience and introduced a 10 minute delay in start time.

During the event, moderators could view participant activities in real time, and after the event we were shown detailed reports that were on par with those generated by Activate and Yahoo Broadcast's application services platforms.

We were disappointed that Akamai did not want to complete the project, but we also feel a need to explain the situation to readers who are considering using the Akamai Streaming Media services and wondering why it was not included in this report.

— Keith Shaw and Christine Perey

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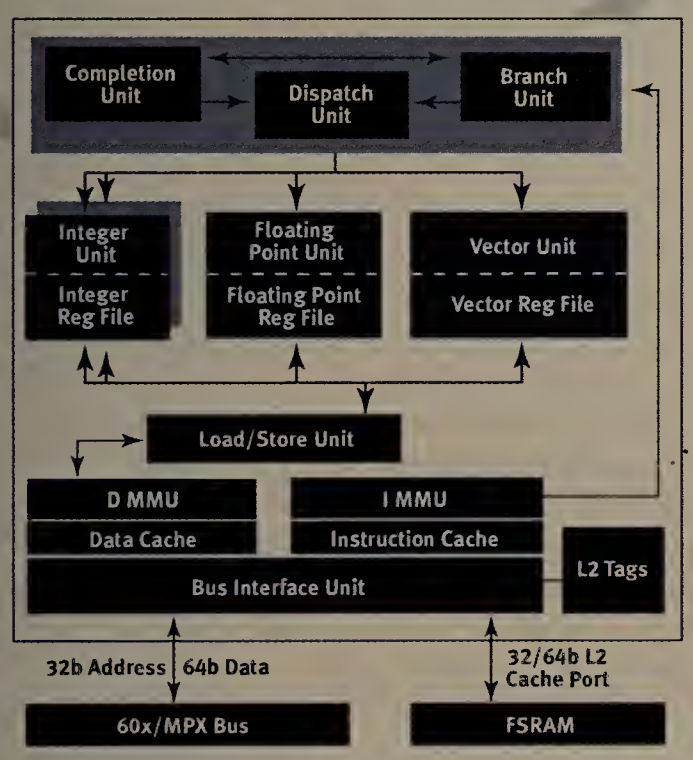

MPC7410 Block Diagram

	MPC7410 400-500 MHz
CPU Speeds - Internal	400, 450 and 500 MHz
CPU Bus Dividers	x3, x3.5, x4, x4.5, x5, x5.5, x6, x6.5, x7, x7.5, x8, x9
Bus Interface	64-bit
Bus Protocol	MPX/60x
Instructions per Clock	3(2 + Branch)
L1 Cache	32-Kbyte instruction 32-Kbyte data
L2 Cache	512 Kbyte, 1Mbyte, or 2 Mbyte
Core-to-L2 Frequency	1:1, 1.5:1, 2:1, 2.5:1, 3:1, 3.5:1, 4:1
Typical Maximum Power Dissipation	5.5W/12W @ 500 MHz
Die Size	52 mm^2
Package	360 CBGA
Process	0.18µ 5LM CMOS
Voltage	1.8V internal, 1.8/2.5VI/O
SPECint95 (estimated)	22.8 @ 500MHz
SPECfp95 (estimated)	17.0 @ 500MHz
Other Performance	917 MIPS @ 500MHz
Execution Units	Integer(2), Floating-Point, Vector, Branch, Load/Store, System

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Continued from page 70

als. The only place we found significant differences was in the pricing. In this respect, Digital Island was the most confusing, and perhaps the most economical service, because it charged on a usage basis, not a flat fee. Digital Island also mirrored its live event response in that valuable supporting information was sent in separate files. In contrast, Yahoo Broadcast's quote came in using plain English, listed all the options included and did not appear to be priced on a per-viewer or total-traffic-delivered basis, although this may have been explained in the fine print.

Activate's response for on-demand services was well-prepared, and the pricing was well-explained. It was particularly strong in explaining the value-added services, such as the numerous signal acquisition technologies for receiving original content from customers and the ad insertion system the company offers.

iBeam's response to the RFP reflected well on the company's sales team, including a complex pricing tool but a succinct summary of the fee that the customer would pay for the proposed services.

On-demand finish line

We believe that on-demand applications are popular to reach global audiences with a consistent yet compelling and memorable message. Based on our measurements and the RFPs, customers who used the Activate and Yahoo Broadcast networks in fall 2000 probably had significantly superior experiences than those who were using the Digital Island and iBeam networks.

Our studies revealed that Activate and Yahoo Broadcast are offering well-managed streaming media networks, have high event and viewer capacity, and finely tuned business processes. Whether deploying live or on-demand applications, corporations are likely to have good results with these vendors. If you are planning to do on-demand and live applications, we recommend that you solicit proposals from these companies, as well as one or two other providers, and choose only one content-delivery network for your streaming media hosting and delivery services.

Perey is president of Perey Research & Consulting, an independent consulting and market research company focusing on business development and opportunity analyses in the emerging networked multimedia industry. Perey can be reached at cperey@perey.com.

Chart 7: Number of packets received by the client per second on average

Vendor	40K bit/sec	100K bit/sec	300K bit/sec
Activate	1,300	3,234	4,552
Digital Island	1,197	3,084	4,086
iBeam	1,255	3,183	4,410
Yahoo Broadcast	1,301	3,238	4,550

SOURCE: KEYNOTE SYSTEMS. NOTE: VENDORS LISTED ALPHABETICALLY.

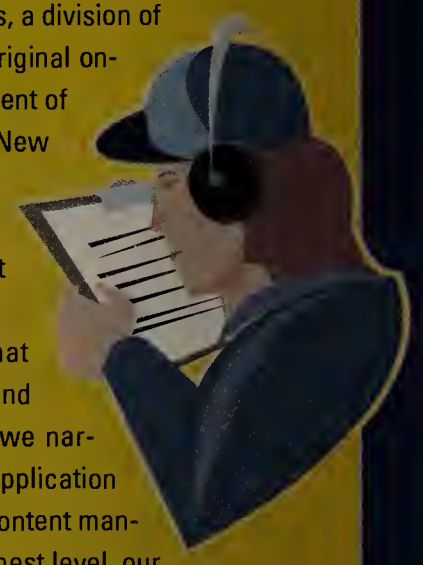
Scorecard

On demand	Performance (50%)	Proposals (50%)	Total score
Activate	8.5	8	**8.3**
Yahoo Broadcast	8	8	**8.0**
iBeam	6	8	**7.0**
Digital Island	5	4	**4.5**

Key: Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. Scoring key: 10 — Can't be better; 9-8 — Excellent; 7 — Very good; 6-5 — Average; 4-2 — Needs improvement; 1 — Not supported or doesn't work.

Race ground rules

Testing service providers is a bit more difficult than testing software or hardware products. In this case, we needed the cooperation of hundreds of people at a number of companies. This study would not be possible without the enormous talent and resources made available by WatchIT.com (content creation); Streamriver Networks, a division of Media100 (for digitizing, encoding and compressing original on-demand content); Keynote Systems (for the measurement of the performance of the service provider networks); New Phase Media (for creation of the project on-demand Web site); and EchoStar Data Networks (for Dish Network access and satellite time for the live-event broadcast phase).



From a starting list of more than 60 companies that offered special services for developing, hosting and delivering streaming media in one form or another, we narrowed the list down to 25 companies that could offer application assistance as well as network transport and special content management options in their service packages. At the highest level, our objective was to focus on and test the process corporate IT managers need to use when evaluating service providers with the skills and infrastructure to reliably deliver streaming media in live-broadcast content delivery or on-demand scenarios. The emphasis was on these two streaming scenarios where they intersect with third-party enterprise network-based audiences.

Go online to find out more details of what was required of the participants (www.nwfusion.com, DocFinder: 2025).

The live-event testing included three phases: network performance measurement; responses to an RFP provided by *Network World* to the participants; and a first-hand experience between Perey Research & Consulting and the participants for a separate live event. In this case, the live event was a 30-minute Webcast conducted by Perey Research & Consulting.

The on-demand portion included two phases: network performance measurement and responses to an RFP provided by *Network World* to the participants.

The live-event testing occurred on Sept. 26, from noon to 1 p.m., Eastern Daylight Time. The on-demand testing took place from midnight on Oct. 24 to midnight on Nov. 7. Two weeks of measurements were taken.

A more complete test plan detailing our tests is available on Network World Fusion (www.nwfusion.com, DocFinder: 2026).

Glossary

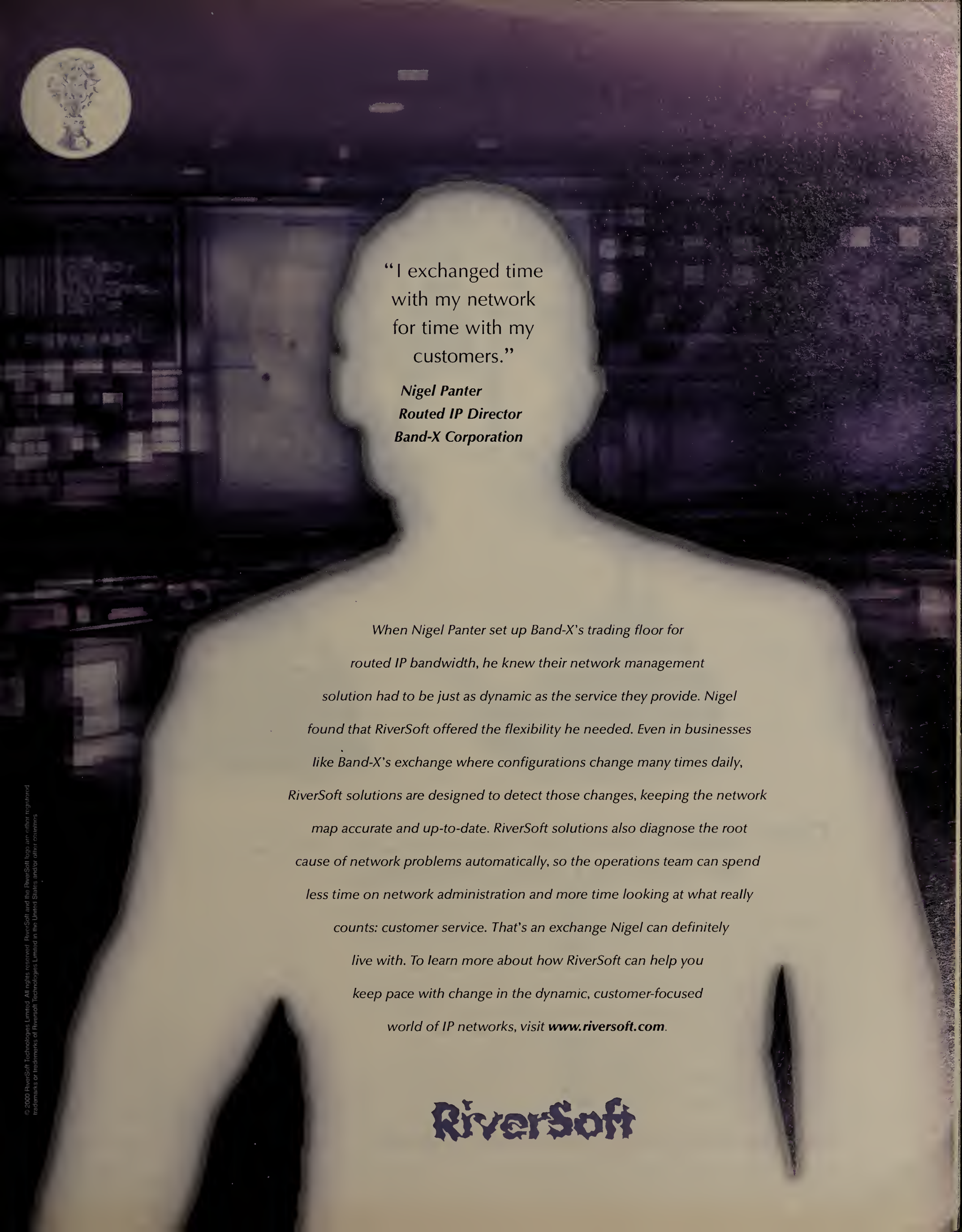
A few definitions of terms related to streaming media:

On demand: The applications and technologies that support a user's ability to click on a word, graphic or icon and launch the playback of a streaming media file stored on a remote server. This is different from requesting the file to be downloaded to the local machine for subsequent playback.

Streaming media network service provider: Companies that own (or have secured access to) and manage video-ready content-delivery networks and video application service platforms on behalf of enterprise customers.

Application services platform: The software components in the network that perform some or all of the following:

- Audience acquisition and management.
- Content acquisition for streaming, on-demand or live broadcast.
- Slide/presentation synchronization.
- Audience/presenter interactivity modules.
- Content analysis (indexing, searching).
- Reporting.



"I exchanged time with my network for time with my customers."

Nigel Panter
Routed IP Director
Band-X Corporation

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*According to Keynote Systems, an independent auditor, as reported in *Boardwatch* Magazine's annual "Directory of Internet Service Providers."

Gigabit Ethernet goes on MAN hunt

New optical Gigabit Ethernet switches trigger IP-based MAN data services.

BY DAVID AXNER

Gigabit Ethernet has replaced ATM as the LAN backbone technology of choice among most network professionals, and now the technology is leapfrogging into the metropolitan-area network as the driver behind a new type of IP-based data service that's cheaper and more flexible than SONET-based alternatives.

Service providers such as Yipes Communications, Vitts and Telseon are using new carrier-class optical Gigabit Ethernet switches as the foundation for MANs that offer IP-based LAN-to-LAN data connections within a metropolitan area for a corporation or customized connections to multiple customers in a single building.

These IP MANs are attractive to application service providers and Web-caching service providers that are looking for a fast, flexible, inexpensive way to deliver Internet, intranet and extranet services to their corporate customers.

Gigabit Ethernet-based MANs offer several advantages over traditional SONET rings, including:

- The connection between the LAN and WAN is easy because Ethernet is running on both sides of the WAN access device.
- Prices are significantly lower than comparable bandwidth on a SONET/ATM network.
- Bandwidth can be turned up in 1M bit/sec increments within minutes of a customer request, compared with having to wait weeks for an additional 1.5M bit/sec T-1 line.

Gigabit Ethernet switch vendors, including Riverstone Networks, Extreme Networks and Foundry Networks, began delivering carrier-class gigabit switches early this year, with other vendors expected to follow suit. These carrier-class switches, also known as aggregation switches, differ from enterprise switches in that they provide connectivity to optical core networks, including SONET, and they provide access to customers.

Catch the wave

Wave division multiplexing (WDM) plays a major role in this scheme by complementing Gigabit Ethernet technology. Full-duplex Gigabit Ethernet requires a fiber pair — one for transmitting and the other for receiving. This can become economically unsound when running numerous gigabit channels to points of presence (POP).

Using WDM, for example, Extreme substantially reduces the number of fiber pairs required to connect to POPs. It uses a 10G bit/sec WDM module to combine eight full-duplex Gigabit Ethernet channels onto a fiber pair, with each fiber carrying four channels of bidirectional traffic.

In the MAN backbone, dense WDM (DWDM) is now replacing traditional SONET switches to provide a substantial increase in bandwidth and dramatically reduces the time it takes to provision a circuit.

Elegy to SONET

SONET has serious drawbacks for packet-oriented traffic. A telecommunications industry technology for highly scalable, large bandwidth traffic requirements, SONET is a time-division multiplexing transport technology that scales up to 10G bit/sec.

It was developed in the 1980s for high-volume voice traffic, and although it can support any kind of traffic, it is optimized for voice. SONET is a hierarchical digital transport technology for transmission over fiber and is organized into 64K-byte (Digital Service, level zero) voice channels.

Its frame format contains large and expanding payload capacities. The payload portion of a SONET frame, called the Synchronous Payload Envelope, is organized into a byte format that expands from 87 bytes (octets) for OC-1 to 16,704 bytes for OC-192. This large payload format can be a limitation because any unused channel capacity is wasted. Packets must be mapped to a SONET frame format, then stripped from the SONET frame on arrival at their destinations.

Data must be packed into these rigid channels, resulting in wasted channel capacity where packets do not exactly fit the channel. This inefficiency becomes more pronounced with increased data traffic on the network.

The high cost of SONET equipment is financially challenging to companies that must scale their networks to meet the demand of exploding data traffic. Other downsides to SONET are its long time cycles and lack of flexibility for provisioning SONET connections to subscribers. Because SONET is voice-oriented, it does not support flexible billing and management features that service providers require to offer value-added services, such as VPNs and Web hosting.

Ode to Gigabit Ethernet

By contrast, Gigabit Ethernet technology addresses data-intensive traffic and is highly-scalable. It also supports Layer 3 through Layer 7 IP packet processing required for developing value-added services, and bandwidth management and provisioning. Gigabit Ethernet switches are an order of magnitude lower in cost than SONET.

By using WDM, Gigabit Ethernet can duplicate the robust dual-ring architecture of SONET by provisioning multiple Gigabit Ethernet channels over WDM fiber to create a scalable, robust, data-optimized optical ring.

Looking ahead, the deployment of 10G bit/sec Ethernet will flexibly aggregate native data traffic across high-speed optical MANs, providing an end-to-end Ethernet network.

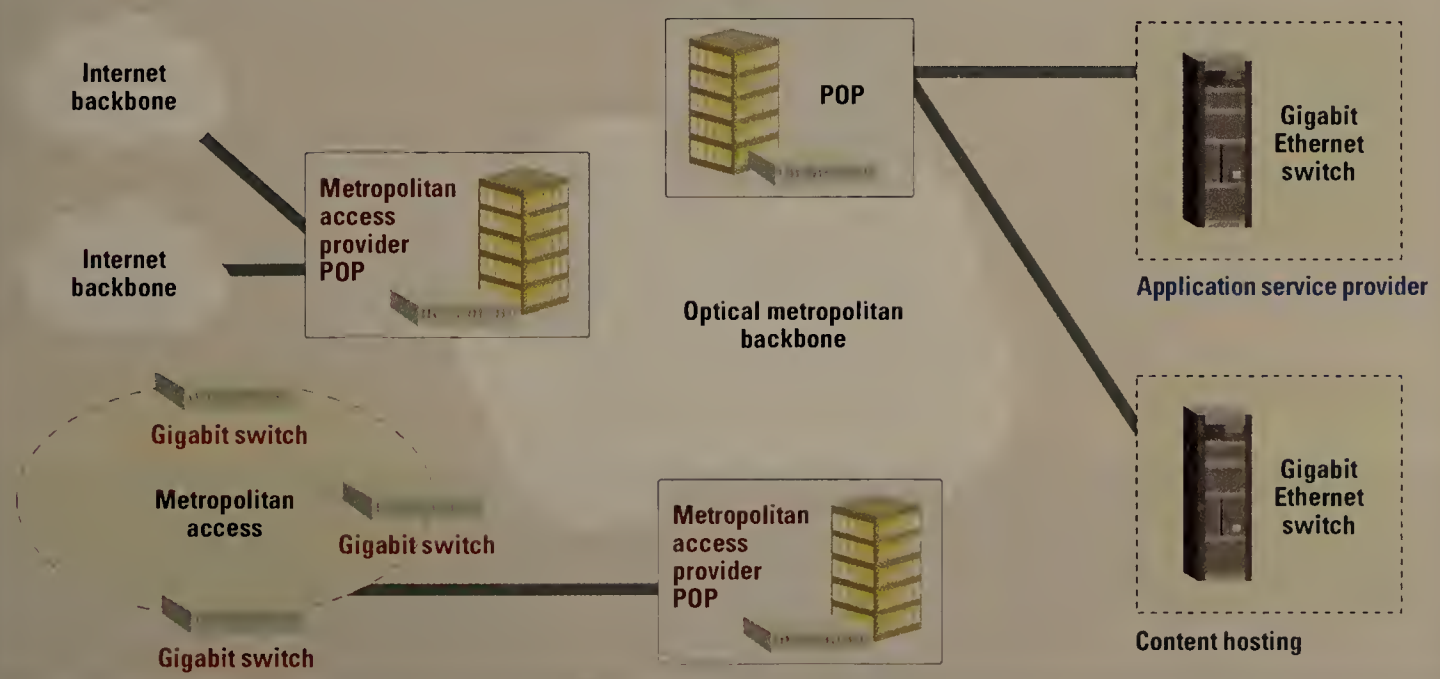
Some of these switches address all requirements for MANs and service provider networks, while others address specific requirements. As the MAN and service provider network markets solidify, vendor switches will undoubtedly increase to address all current requirements.

Dawn of Gigabit MAN

Gigabit Ethernet technology is becoming the technology of choice for today's data-intensive MANs. It is an economically sound, large-band-

The new MAN

The IP-based metropolitan-area network will rely on carrier-class Gigabit Ethernet switches.



width solution that provides access flexibility and connectivity with SONET or emerging DWDM-optic networks.

Extreme has demonstrated that it can replace SONET rings with Gigabit Ethernet switches using DWDM to provide an end-to-end Ethernet network that supports voice, video and data.

Other vendors position their switches on the edge of a core SONET network, enabling MANs and service providers to provision network services to subscribers, while maintaining the SONET core for high-volume traffic. While some switch vendors provide Ethernet only to the POP, others support mixed media to provide connectivity to virtually all subscriber network media. MANs are migrating from a voice-optimized network to a data-optimized network that will support value-added business services.

Axner is a freelance writer. He can be reached at daxner@earthlink.net.

Carrier-class Ethernet switches

1. Riverstone

Riverstone hits ALL the hot buttons and is a good example of what a carrier-class switch should be. Riverstone's family of RS 8000, 8600 and 32000 switch routers are architecturally the same, and use the same operating software and I/O modules.

Service providers must be able to accommodate a mixture of existing and emerging media, including legacy copper and fiber. Although fiber to the curb is rapidly growing, it still accounts for only 10% of all building access. The remaining 90% is through copper cable via T-1, T-3 and DS-3 circuits running frame relay, PPP or ATM.

FACTOID

The 10G bit/sec Ethernet standard will be a major step up for Gigabit Ethernet switches used in MANs and service provider networks because it not only will provide the necessary bandwidth for backbones, but it also will enable seamless connections to OC-192 SONET links. The 802.3ae task force is developing a standard that will provide a fit between 10G bit/sec Ethernet and the OC-192 payload rate of 9.58464G bit/sec. This will let Ethernet be used as an end-to-end transport protocol.

These switches are deployed in service provider networks and metropolitan-area networks.

The RS 32000 switch/router is Riverstone's carrier-class switch, which addresses all carrier-class switch requirements.

Its large switch capacity of 128G bit/sec and high performance of 90 million packet/sec make it suitable for high-volume MAN traffic. Bandwidth control and provisioning within the RS family of switch routers can be conducted on bit-level increments from 1K bit/sec to 1G bit/sec.

This enables service providers to slice bandwidth into subscriber-specified increments and then dynamically allocate bandwidth on customer request. This lets service providers service multitenant buildings and campus environments, where multiple subscribers each want a segment of the overall bandwidth provided to a building.

Riverstone's hardware-based accounting characterizes each subscriber's traffic pattern, enabling service providers to track subscriber utilization and predict increasing bandwidth requirements.

Riverstone's RS family of switches provides connectivity through a range of interfaces for deployment of services across virtually any infrastructure. Therefore, RS family interfaces include frame relay, T-1/E-1, DS-3/channelized T-3, ATM OC-12 and Packet over SONET (PoS), which supports OC-12 through OC-48. Riverstone's PoS support provides connectivity to SONET core networks.

Telseon, one of the new breed of MANs, uses Riverstone's RS switch routers in its network. Real-time bandwidth provisioning enables Telseon to respond to changing subscriber requirements. The company also provides its subscribers with a Web-based tool with which they can self-provision additional bandwidth. This capability is useful for temporary events — for example, an hour-long videocast to all employees worldwide.

2. Foundry

Foundry's carrier-class entry is the BigIron 15000, a switch/ router with a whopping switch capacity of 480G bit/sec and performance of 178 million packet/sec. Foundry targets this switch to MANs and service provider networks for deployment in network backbones. Foundry provides an Ethernet offering for MANs that it calls Global Ethernet. Its BigIron switch provides short-, medium- and long-haul Gigabit Ethernet interfaces for connections to a MAN. Long-haul optics supports gigabit connections up to 150 kilometers, which means the switch can service corporate customers up to about 90 miles from the MAN.

On the core network side, Foundry provides connections to SONET core networks because SONET is the ubiquitous transport technology and is widely deployed. The BigIron switch provides PoS interfaces for OC-3, OC-12, OC-48 and, in the future, OC-192. Foundry does not support application flexible WAN interfaces such as frame relay, T-1/E-1 or DS-3. Instead, Foundry supports highly scalable Layer 2 virtual LANs for MAN subscribers, which it calls VLAN Super Aggregation because it scales up to 16 million VLANs. Each VLAN can then be used as VPN by a MAN subscriber. Foundry's Global Ethernet offering addresses multitenant building and campus network connectivity.

3. Extreme

Extreme has deployed its Black Diamond and Alpine series switch routers in several MANs and service provider networks. Extreme uses its WDM module to provide an optical backbone to connect its switches in the network, rather than connect its switches to a SONET eore network. Its WDM module supports distances of up to 35 kilometers (22 miles) between switch locations. Extreme's Black Diamond 6816 is a carrier-class switch with a substantial switch capacity of 256G bit/sec and a performance of 192 million packet/sec. The Black Diamond 6808 provides half the switch capacity of the 6816 and half its performance.

Extreme's Alpine 3800 series switch routers also come in two sizes that provide either half or a quarter of the switching capacity and performance of the Black Diamond 6808. These incremental switch capacities enable Extreme to match switch capacity with bandwidth requirements within a network. Alpine 3800 switches can slice bandwidth to provision subscriber service in 500K bit/sec increments. The switches can be used to provision service in either the network core, the point of presence (POP) or the customer premises, such as in a multitenant building. Extreme also deploys its small Summit I series switches in POPs loeated on a customer premises as an aggregation switch. These switches also sliee bandwidth for service provisioning.

Extreme's switches do not support WAN interfaces. They provide Ethernet interfaces only. Extreme interconnects the switches within a network using its wave division multiplexing (WDM) module. Extreme's strategy is to replace the SONET ring with a data-optimized optical ring via its WDM module as an Ethernet service provisioning platform.

Extreme supports voice over the network using a proprietary technique it calls IP Time Division Multiplexing, which adds circuit emulation to Layer 3 IP. This enables fixed, guaranteed latency circuits to be established for voice and video traffic over the network using fixed 64-byte packets and tagging techniques to identify voice traffic. Extreme also uses hardware-based billing techniques to meter traffic and utilization.

MAN benefits

Enterprise requirement	MAN service	Enterprise benefit
Secure networks	Multiple VPNs	Eliminates unauthorized access
Fast Internet access	Broadband Internet connections	Immediate access to Web sites
Applications availability	Application service providers	Access to needed applications

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Management Strategies

Career Development, Project Management, Business Justification

Lessons learned

An IT executive looks back on her 27-year career and shares what she would have done differently.

BY DENE' BETTMENG

Managing our careers is much like managing the complex network infrastructure and application projects we deal with every day. Only in this case, we're talking about our own lives. As we strive to accomplish career objectives, some of our choices may be sound and productive — serving to enhance desired outcomes in substantive ways. But other decisions can be downright harmful, detracting from longer-term accomplishments or even setting us back at times.

Looking back on my 27-year career in IT management with United Airlines, American Airlines/Sabre and J.D. Edwards, a few critical determinants either furthered my success or were behind the failures I had to overcome along the way. I hope that by sharing them here, you can avoid some of the challenges I've encountered.

Mentoring

Although the concept of mentoring has been around for a long time, there is still great validity to the importance of a mentor in furthering one's career. In my experience, there are two main considerations when looking for someone to help you along.

First, your choice in mentors must be someone who has more experience and exposure in your organization than you do.

And second, that person's view of the company and its workings must be derived from a 30,000-foot view — and not merely focused in a narrow niche or short-term perspective.

Guidance from someone with broader experience and contacts within the company — and an opinion that is valued throughout — will come in very handy when you need a champion to go to bat for you. Further, his or her wisdom can point you in the right direction — or even another direction — when your choice may not have been the best. But the transfer of a mentor's hard-earned leadership skills may be the most important long-term benefit.

Marketing yourself

When you're assigned less-visible IT duties in the early part of your career, one of the greatest challenges is coming up with a way to be noticed. For example, some may perceive the move of your IT department from one building to another as routine. However, those responsible for a smooth transition should remind others of the benefits of a job well-done. Say systems were available significantly more than the agreed-upon time stated in a service-level agreement. This is reason to celebrate and let others in your company know of your accomplishments.

You may also want to consider:

- Publishing an article in your company newsletter or Web site on you, or your department's improvements and accomplishments.
- Volunteering for high-profile projects not directly related to your regular responsibilities to help those in other parts of the company get to know you, your talents and skills.
- Giving presentations at meetings and conferences, and participating in panels and forums, both within the company and externally.

Proactive networking

The best way to further your career is through professional contacts, as evidenced by the fact that 80% to 90% of IT workers get their jobs through networking. A sudden layoff or downsizing will make the importance of networking clear to those who have neglected it for a while.

Be proactive about keeping up with any and all IT-related contacts and relationships — no matter how old. You may have only a small number of contacts at the start, but even a handful of key people can make a world of difference in such an active and interconnected industry. Don't neglect proactive networking or you may be sorry.

Calling it quits

Over a career built of great wins and some devastating letdowns, I've identified three elements that will cause me to call it quits if they're missing. You may wish to add or adapt these questions for your own list:

- Is the work environment challenging? Are leaders respectful of me, my knowledge and my recommendations?
- Are my leaders trustworthy? Do they walk their talk and live by a code of ethics that they follow themselves?
- Is the workplace family-friendly? Is the company truly empathetic to family needs and the idea of balance in my life?

To keep good people, flexibility is critical. But if a company isn't living up to its employees' expectations, attrition will generally take care of any deviations from acceptable corporate culture today.

We all have a natural tendency to conduct our careers in the ways most comfortable to us — usually via the path of least resistance. But after you've worked hard to get a career moving, you should do everything in your power to further the opportunities that arise, and avoid pitfalls along the way.

If I could go back in time, these are the things I would do differently. I hope you'll apply them and discover their immense impact on your career development and fulfillment.

Bettmeng recently left her employer to start her own company, Strategic Leadership Technologies in Denver. She can be reached at dbettmeng@excite.com.

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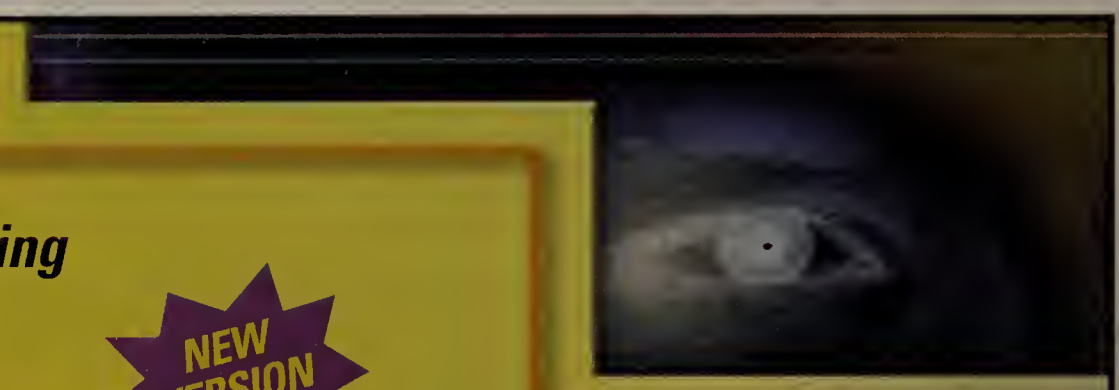

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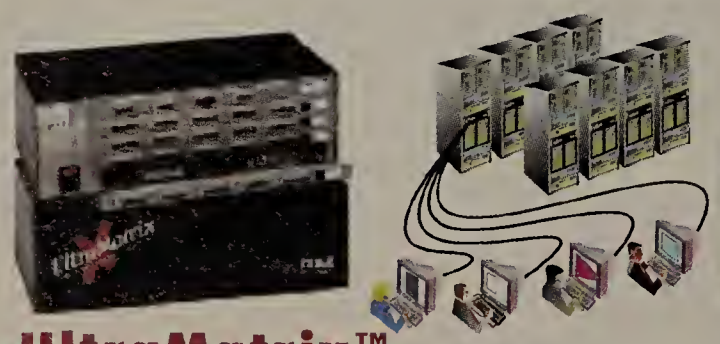

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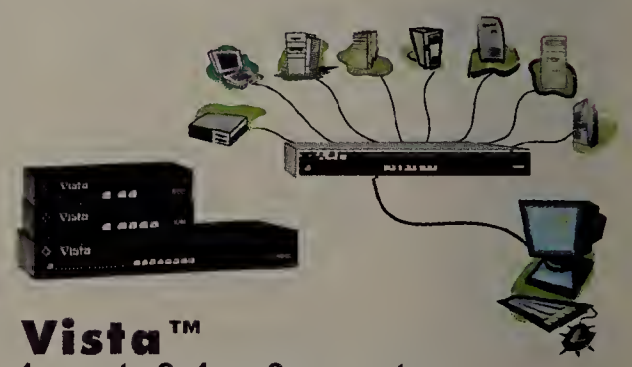

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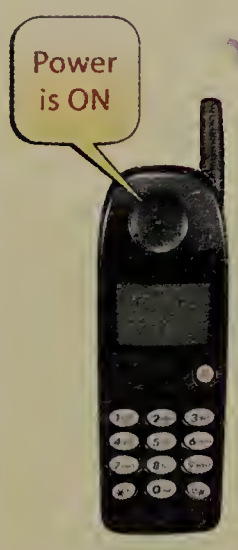

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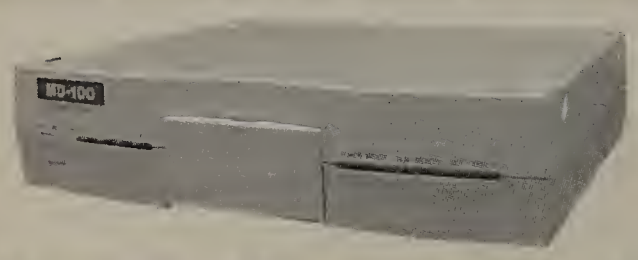

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Software Engineer needed for electronics company in Princeton, NJ to develop broad band communications technologies incldng prototype design; 40 hrs/wk; Master's deg in Comp Sci, Mathematics or MIS; no previous exp. Contact: HR Dept, PTI/MECA, 1 Panasonic Way, Panazip 3C-6, Secaucus, NJ 07094.

Systems Engineer: Analysis, design and development of computer software including development of Internet/Intranet applications using object oriented methodologies C/C++, Visual C++ and JAVA in Windows and UNIX environments. Bach in Comp Sci, Comp Engg, or Elec Engg. Respond to: HR Dept, DVC Group, Inc., 44 Whippany Rd., Morristown, NJ 07960.

System application prvdr sks IT Analyst. Resp. for acctg and admnstn-rlted sys in IT unit. Req'd: B.S. in Computer Science & 2 yrs exp in job offrd or as Systems Analyst. Send resume to Mr. Kyu S. Lee, Samsung Data Systems America, Inc., 105 Challenger Rd., Ridgefield Pk., NJ 07660.

Internet/Web Site Analyst wanted by Int Mktg Communications Co in Manh. Responsible for directing, research, & managing internet/extranet website dev; website proj management, build & manage internet sites. Bach of Arts in Commmunications, Media or Comp Science & 2 yrs exp in job req. Respond to: HYL/HR Dept, P.O. Box 4241, GCS, NY 10163.

Digital Imager wanted by Internet Incubation Co in New York, NY uploading and laying out images of jewelry designs on the company's web page. Must have Bach deg in Photography and knowledge of relevant software. Respond to HR Dept., EJAA.net, 608 Fifth Avenue, Suite 410, New York, NY 10020.

Software Engineers, Programmer Analysts, Database Analysts needed by NJ based IT firm. Please apply with 2 copies of your resume to H.R. Department, Apriori Solutions, Inc, 200 Middlesex Turnpike, #301, Iselin, NJ 08830.

Systems Engineer

Install, maintain, administer and resolve hardware and software problems on computer desktops/laptops. Must have MS in Computer Engineering and 6 mos experience in support for hardware and software. Job located in Groton, CT. Respond to: Donna Byrne, InfoTech Contract Services, Inc., 400-1 Totten Pond Road, Waltham, MA 02451.

Computer Engineer positions available at NYC e-commerce firm to develop and program software applications for network, to design database structure and establish data server. MS in Comp. Sci. or Engg. Send resume to HR Department, LinkShare Corporation, 215 Park Avenue South, 8th Floor, New York, NY 10003.

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Perform the duties of a graphic design analyst in regard to layout design, layout color design, artistic illustration in fine art or books, magazine, publications and paper products. 40 hrs./wk. 9am-5pm. $39,790.40 annually. BA Degree with major in Graphic Arts required. Supervise 2 employees. Send resume to: Agency for Workforce Innovation, Workforce Program Support. P.O. Bx 10869, Tallahassee, FL 32302 JO# FL2134876

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Senior Systems Consultant sought by computer consulting company in Maitland, FL to perform consulting services at various locations throughout the US. Systems analysis, design and implementation in Sybase SQL environment. Req. Bach Sci Computer Sci or equiv.+2 yrs exp. Please send resume to HR Dept 21711 W 10 Mile Rd Suite 111, Southfield, MI 48075.

Software Engineer needed for technology division of electronics co located in Princeton; 40 hrs/wk; master's deg in Comp Sci, Electrical Engg or Math & no exp nec in job offered or bach's deg in Comp Sci or Math & 2 yrs exp in job offered. Contact: HR Dept, MECA, 1 Panasonic Way, Secaucus, NJ 07094.

SAP Programmer/Analyst wanted by Computer Services Firm to plan, develop, test and document financial applications using SAP R/3 software FI and ABAP modules with ORACLE database in Windows NT environment and Java. Bach. in Acc't or Information Mgt. Systems and 5 yrs. exp. (will accept MS in lieu of exp.) Respond to: HR Dept, Vertex Soft, Inc., 622 Georges Rd., Suite 104, North Brunswick, NJ 08902-3377.

Sr. Programmer Analyst: Duties incl to analyze, dsgn, dvlp & implmnt s/ware applns in accordance w/client specs, modify &/or enhance systems capabilities by using C, C++, Oracle, PL/SQL, Visual Basic on UNIX & Windows Envirmnt. M.S. in Comp. Science/Engg. or B.S. in Comp. Science/Engg. with 5 yrs of progressive exp. Salary range $60K to $75K/yr + Med. Benefit. Resume to: President, Softech Int'l Resources, Inc., 12th Fl, E. Tower Center Square, 1500 Market St, Phila, PA 19102.

Senior Software Engineering positions available in Morrisville, NC to design, architect, and implement n-tier distributed wireless advertising infrastructure. Master's in comp. Sci. or related field with appropriate experience. Send resume to HR Dept., Windwire, Inc., 100 Perimeter Park Drive, Suite 1, Morrisville, NC 27560.

Software Engineer needed by IS/IT Consulting Co. in Metuchen, NJ for locations throughout the US. Must have Masters in Comp Sci, Comp Engg, Electronics or Electrical & 3 yrs software experience. Will accept Bachelor's and 5 yrs of exp. Respond by resume to: HR Dept, NetCom Systems, Inc., 61 Pearl St, Metuchen, NJ 08840.

Software Technical Services, Inc, Alpharetta, GA has immed openings for exp' ed Prog/Sys Analysts, S/W Engineers and DBAs in the following areas: AS/400, Mainframes, COBOL, VB, Oracle, Oracle Financials, Sybase, Java, HTML, SAP, Internet development, PeopleSoft, Database/UNIX admin. Salary: $60,000 to $90,000. Travel/relocation required. Over 30 positions open. All positions require BS/MS in CS/Engg/Bus Admin/Math/Science and relevant exp. Foreign equiv. of edu. and/or combination of exp and edu. will be accepted. Resumes to. HRD, 105 Nobel Ct, Alpharetta, GA 30005.

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Design, develop and test the MATLAB family of products. Programming experience in MATLAB, and/or C, C++, Java is required.

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Develop next generation embedded real-time code generation product. Experience using Perl, M, C and TLC programming languages is required.

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Provide advanced technical support which includes designing, developing and delivering training sessions on our products to Engineers within your department, and attending trade shows to demonstrate the capabilities of our products. One year of programming with MATLAB is required.

Tools Engineer
Enhance and maintain internal Web-based defect-tracking tools. Enhance and maintain Web interface to source code control and configuration management. Experience developing and/or designing for the web. Experience with some or all of the following: UNIX, Perl/CGI, SQL, HTML, and Java.

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Reply to: S. Nemani, Princetec Consulting, 4365 Rte. 1 South, Princeton, NJ 08540. FAX (609)720-9800.

Programmer/Analyst. Consult with user to identify current operation procedures and clarify program objectives. Formulate plans outlining steps required to develop programs using structured analysis and design. Prepare flowcharts and illustrate the sequence of steps of the program. Develop, test and operate teaching programs for Cobol II, Visual Basic 6.0, Access 97, MS SQL Server, Crystal Reports, Lotus Notes and AutoCAD, Oracle, Java and JavaScript. Requires: Bachelor's degree in Comp. or Info. Science or related field. 2 yrs. exp. in the job offered or as a System Programmer or Software Engineer. EOE. 40 hrs/wk. Salary: $62,000/yr. Send resume (no calls) to: Naum Brodsky, A-Soft, Inc., 3620 DeKalb Technology Parkway, Suite 2000, Atlanta, GA 30340.

Full time Systems Analyst responsible for design and development of Client Server and Internet and Intranet applications for company and its clients. Help clients to be on the WWW and will allow them to perform electronic commerce and customer servicing. Develop these applications on UNIX platform using C++, JAVA, HTML and Oracle languages. Develop internet applications architecture. Must have a Bachelor's Degree in CS, any engineering discipline or related field. Foreign degree equivalent accepted. Must have two years of experience in the job offered or in positions with same duties. Salary: $66,000/yr. Send resume to: Raj Shekaran at SRA, 70 Mansell Court, Suite 100, Rosewell, Georgia 30076.

Systems Analyst, Trading Systems-Investment Management firm seeks System Analyst with experience in graphics/GUI programming and Unix Systems Administration to provide software and hardware support for computer system utilized by trading room. Duties include development, enhancement, maintenance & support of trading room customized software & developing software interfaces linking the trade desk with research & accounting groups. Required: Master's in Computer Science; 6 months experience or 6 months as Programmer Analyst. Salary according to experience. Send resume to RTC, 600 Route25A, East Setauket, NY 11733, ATTN: HFHC4

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MS or BS (depending on level) in Eng., CS, Math or Physics + exp. designing and implementing Oracle RDBMS and Oracle financial modules and apps util. SQL to run on Unix and Windows o/s.

Oracle Functional Applications Developers (Job #AA-103)
3 years exp. designing and implementing Oracle RDBMS and Oracle financials and manufacturing modules and apps utilizing SOL, Des/Dev. 2000 to run on Unix and WinNT o/s.

Oracle Manufacturing/Financials Analysts (Job #AA 105)
BS in Eng., CS, Math or Physics + 2 yrs exp. designing and implementing Oracle RDBMS and Oracle manufacturing and financial modules and apps util. SQLand Des/Dev 2000 to run on Unix and WinNT o/s.

Job Location: Based in El Segundo, may be assigned to projects at various unanticipated client locations throughout the U.S. Exp. may be gained concurrently. Premium salaries offered, including full benefits and bonuses. Send resume to A. Abeyta, 888 SW Fifth Ave., Suite 1100, Portland, OR 97204. All responses must include job number for consideration. EOE.

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CSC currently has the following openings:

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MS or BS (depending on level) in Eng., CS, Math or Physics + exp. designing, developing and implementing RDBMS and related apps util. SQL, C/C++ and scripting langs to run on Unix and Win o/s.

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BS in Eng., CS, Math or Physics + exp. designing, developing and implementing RDBMS and related dist. apps util. SQL, HLL, Designer /Developer to run on 32 bit multitasking/multithreaded o/s.

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Job Location: Based in El Segundo, may be assigned to projects at various unanticipated client locations throughout the U.S. Exp. may be gained concurrently. Premium salaries offered, including full benefits and bonuses. Send resume to A. Abeyta, 888 SW Fifth Ave., Suite 1100, Portland, OR 97204. All responses must include job number for consideration. EOE.

Software Engineer sought by company in Lakewood, CO specializing in computer software development & consulting services to work in Lakewood & other unanticipated job sites in the US. Design & develop web-based & client/server software applications & modules that run on Windows NT & UNIX platforms, & incorporate Oracle & Informix relational database management systems. Create designs & design documentation. Code, test, & de-bug the software applications. Implement CMM standards. Use C++, Java Script, HTML, PL/SOL, Developer 2000, Designer 2000, Power Builder, & Visual BASIC, as well as other tools & languages, in the design & development process. Requires Bachelor's or foreign equivalent in comp. sci. or related field (incl. comp. sci. eng.); 2 yrs. exp. developing client/server software applications; working knowledge of Designer 2000 & Oracle. 8am-5pm, M-F; $66,100/yr. (3 openings.) Respond by resume to James Shimada. Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver. CO 80202, & refer to Job Order Number CO4683364

Senior Software Engineer sought by company in Lakewood, CO specializing in computer software development & consulting services to work in Lakewood & other unanticipated job sites in the US. At a senior level, design and develop web-based and client/server software applications and modules that run on Windows NT and UNIX platforms, and incorporate Oracle and Informix relational database management systems. Direct the work of other Software Engineers engaged in such projects. Create designs and design documentation. Code, test, and de-bug the software applications. Implement CMM standards. Use C++, Java Script, HTML, PL/SOL, Developer 2000, Designer 2000, Power Builder, and Visual BASIC, as well as other tools and languages, in the design and development process. Requires Master's or foreign equivalent in comp. sci. or related field (incl. comp. applications); 1 yr. designing & developing client/server software applications; working knowledge of Oracle, Developer 2000, & C++. 8am-5pm, M-F; $66,100/yr. (3 openings.) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO4683366.

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Software Consultant to customize, implement & test various functional modules; system study, analysis, design & development using Oracle & PowerBuilder; sales & distribution & production planning in SAP R/3 system; create reports for modules in ABAP/4 programming language; unit & integration testing, debug & correct for total system acceptance; Reqs. Master's in Comp. Engg., Comp. Sci. or Comp. Info. Systems plus 1 yr exp in the job offered or 1 yr related exp as Consultant, Lecturer, Project Mgmt. Consultant or Partner. Related exp must include 6 mos of system study, analysis, design, development, testing & implementation using Oracle & PowerBuilder; $59,500/yr, 40 hrs/wk, OT as req'd, 8a-5p. Applicants must show proof of legal authority to work in U.S. Send 2 resumes & cover letter (no calls) to Illinois Dept. of Employment Security, 401 S. State St. - 7 North, Chicago, IL 60605, Attn: Shella Lindsey, Ref. #V-IL23563-L. An Employer Paid Ad

Quality Assurance Engineer. Job location: San Francisco, CA. Duties: Prepare test plan, test cases & automate test scripts for performance testing & functional testing. Configure & manage bug tracking systems. Create scripts using Advance level Object Oriented 4 Test Language & Bench Mark definition language. Test client server applications. Develop E-Commerce applications. Configure the IP load balancer to maximize number of threads under various combinations of load & stress tests. Analyze testing results. Provide recommendations to enhance the performance of applications. Prepare reports. Requires: M.S. or foreign equiv. in Engineering, Comp. Sci./Info. Sci or a closely related field plus 3 yrs exp. in the job offered or 3 yrs exp. as a Soft./Quality Assurance Engineer. In lieu of M.S. or foreign equiv., will accept a Bachelor's degree or foreign equiv. plus 5 yrs of progressive exp. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606.

Programmers/Consultants/Engineers/Analysts needed. Pleasant Hill, CA company has several senior and entry-level positions available for qualified candidates possessing MS/BS or equivalent and relevant work experience. Must be willing to travel and relocate as required. Work with C, C++, Java, JSP, Servlets, EJB, Networking, TCP/IP, directory services, LDAP, Linux, Perl, CGI, application servers and Unix. Fax resume to P.A.C.E., a division of Jerzy Inc. (888)453-0589 attn: HR Dept. or email to hr@pace-pros.com

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Regional Managing Partner. Job location: Portland, Oregon. Duties: Develop the office business plan. Define core competencies & standardize tools & processes. Develop training programs. Identify & develop plans to evolve & extend competencies into new areas. Develop & coordinate employee retention program. Oversee & implement P&L mgmt, business developments, client satisfaction, staffing, service delivery & leadership. Requires: Bachelor's or foreign equiv. in Business Administration plus 4 yrs exp. in the job offered or 4 yrs exp. as a Marketing/Account Director. Exp., which may have been obtained concurrently, must include: 2 yrs exp. overseeing and implementing P&L management. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606.

A5400 System Analyst wanted by a Healthy Care Distribution in Waukegan, IL. Must have a Bach or equivalent in Computer Science and 2 yrs. exp. in planning, executing and supporting daily operations, production plus robot jobs in various subsystems on 7 IBM AS400. Reply to: HR Dept, Premier Technical Solutions, 1415 E. 22nd Street, Suite 150, Oakbrook, IL 60523.

REAL – TIME SOFTWARE DEVELOPER sought by trading consultants co. in Houston, TX. Must have M.S. in Comp. Sc. plus 2 yrs. exp. in real-time software developing. Respond to: H.R. Dept. DP/HZ, Commodity Advisory Corporation of Texas, 9301 S.W. Freeway, Ste 420, Houston, TX 77074.

Programmer Analyst wanted by Mfg Co. in St. Louis, MO. Maintain ERP systm, incl customizations, systm expansion, upgrading & testing. Train MIS staff on PRO-IV & Glovia systms. Implmtn of new releases of Glovia systms. Troubleshooting & tech support. Req Bach in Comp Engg, Comp Sci or closely related field & 2 yrs exp. M-F. 40hr/wk. Please send resume to: C. Hager & Sons Hinge Mfg Co, PO Box 12300, St. Louis, MO 63157-0300.

Software Engineer
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Programmer/Analyst wanted by Int Ad Agency in Detroit. Dev program procedures for bus problems & complex systems; maintain existing programs; write new programs; generate & test program codes. Bach in Elec or Comp Engineering & 5 yrs exp in job req. Respond to: LT/HR Mngr, One Detroit Cntr, 500 Woodward Ave, Detroit, MI 48226-3428.

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Candidates should have demonstrated successes in improving the performance of large IT organizations through the implementation of methods and practices with extensive experience in application development and implementation. A background in public safety, utility, general government, major ERP systems and web-based applications is ideal. Candidates must be able to function well in a collaborative environment and develop broad-based support for change. Experience with a state or local government is highly desired.

To learn more about this opportunity go to http://www.cityofseattle.net/jobs/. Apply by sending a resume and cover letter to Jean Mayes, Human Resources, Department of Information Technology, City of Seattle, 710 Second Ave., Suite 450, Seattle, WA 98104. Please refer to Job #002-18. Position closes on December 31, 2000.

Information Technology

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The Lancaster Health Alliance has a current opportunity for a Database Administrator to perform systems analysis, database administration, development, testing, and implementation tuning of application packages in relational database and client server systems. Requires a Bachelor's degree in Computer Science with 2 years of IS experience and 2 years of experience as a Database Administrator.

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•Manage Oracle 7.3.3/7.3.4/8.1.5, Sybase 10/11, data servers on RS/6000, HP-9000.
•In-depth knowledge of writing TSOL, PL/SQL and SOL scripts
•Monitoring and performance tuning of Oracle, Sybase databases, SOL queries and batch scripts.
•Familiar with C programming language and UNIX shell scripts.
•Handle backup, recovery, and security tasks.
•Install, maintain and upgrade Oracle and Sybase software.

Please contact Lisa Whitacre, Human Resources Representative, via fax (717) 290-4988; or e-mail: lmwhitac@lha.org EOE.

LANCASTER HEALTH ALLIANCE

Systems Analyst Database Administrator

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CIRES / UNIVERSITY OF COLORADO

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Job Type: Full-Time
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State: Nationwide
Country: USA
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Job Description

Professional Research Assistant
University of Colorado, Boulder

The Cooperative Insitute for Research in Environmental Sciences (CIRES) is seeking a professional research assistant to design advances distributed weather forecasting systems. The selected candidate will collaborate with the Forecast Systems Laboratory in exploring new computer system architectures for weather forecasting systems using the latest network technologies. The exploration will include the design and implementation of selected system prototypes using object oriented design and programming.

Qualified candidates will have an M.S. degree in telecommunications or related field and experience designing and developing real-time meteorological systems. In addition, candidates must have experience implementing advanced real-time computer systems that consist of multiple interconnected nodes which acquire, process and display a diverse set of data.

The salary range for this position is from $45,000 to $50,000 depending on the qualifications and experience of the candidate. Send letter of application, resume, and name and address of three references to Job Code FSL-1, UCB 216, Cooperative Insitute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80309-0216. CIRES is an Equal Employment Opportunity Employer.

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Epoch Technical Services, Inc., has immediate multiple openings for exp'ed IT professionals in the following areas (various skills combination reqd.) JavaScript, Jaguar, PowerDynamo, WinNT, Unix Server, Informix, MFG/PRO, SQL Server, Sybase, FoxPro, Progress, Oracle, ObjectCycle, PowerBuilder, Btrieve. Some positions require MS or equiv. CS, Engg, Math, Bus. Admin, or rel. field while others require BS or equiv. as above. Pay commensurate with exp. Foreign equiv of educ. and/or combination of educ/exp. will be accepted. Travel/relocation reqd. Resumes & salary expectations to HR, 291 Heron Avenue, Naples, FL 34108

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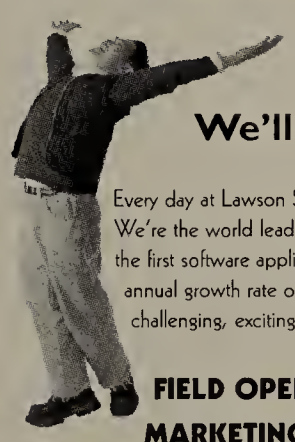

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IT Careers in Software Engineering

While e-business, e-commerce and web enablement have been the headline items for information technology over the past year, the fact remains that at the base of all the IT activity is software. Someone, somewhere is engineering the language and code that enable business.

It's this core competency - software engineering - where the stakes are highest for employees. Companies work overtime to attract and keep software engineers who support businesses as far flung as mailing systems and communications, aerospace and financial services. Salaries have skyrocketed, and signing bonuses have gained an all-new meaning. However, the savvy companies know that it isn't a gimmick that gets and keeps the highly qualified software engineer. It's the nature of the work.

BindView Corporation
Houston, TX

BindView, founded 10 years ago, is a leading provider of software solutions that enhance business performance by ensuring the integrity and reliability of the IT infrastructure. BindView's comprehensive software offerings secure and simplify the management and administration of network operating systems, directories, and related applications. In addition to software, the company provides customer support teams. The company has development sites in Houston, Boston, Fremont (CA) and Arlington (VA).

The company claims four keys to its success. "The first is education," explains Ann Cooksey, director of recruitment. "We offer a combination of in-house and third-party training and attendance at conferences, symposia and exhibitions. We expect our developers to seek training and support them in doing so." The second key is introspection. "We expect developers to always be looking for better ways of accomplishing old tasks," adds Cooksey. "We offer a culture of excellence, screening applications both on attitude and skills. We look for people who will continue to grow and who are not satisfied with good enough. Finally, we believe communication is key. We evaluate processes and constantly seek to improve them."

The company is seeking to fill positions that include all levels of software development engineers; deployment engineers; configuration manager/version control engineers; user interface designer/graphic artists; software system test engineers; software quality assurance engineers; information developers and build-system engineers. "We look at resumes for where you've worked and when, the tools and software you've used, education and a description of your work experiences," says Cooksey.

"We put a lot of effort in recruiting top talent and then keeping them," she says. "We offer the latest equipment in a comfortable and casual work environment, have a commitment to research and development and act on employees' ideas and suggestions. BindView is a dynamic, fast-paced and comfortable company. We translate future business challenges into technology and tools. The top selling point for BindView is the people. We tend to have the top of the best, attracting people who want to be in a learning environment and who want to be part of a group that is figuring out things that have never been done before."

Lawson Software
St. Paul, MN

In the lore of software companies, Lawson Software is the elder statesman. Founded 25 years ago, the company continues to develop and provide software applications and upgrades to the healthcare, retail, professional services, telecommunications, public sector and financial services sectors.

"In the past month we've released our latest version of lawson.insight, offering new modules and functionality enhancements for our targeted markets," explains Terry Boevers, company spokesman. "We also are partnering with application service providers and partners who can add value to our solutions for additional markets. In this way we can quickly add new Lawson users and get into new markets we couldn't approach before, something we call our Lawson dot-community strategy." Lawson also is delivering 360-degree e-business solutions. "We want to automate business process from beginning to end," adds Boevers. "For instance, in procurement we want to provide customers with a solution that works from req (requisition) to check (payment)."

Paul Laidlaw, associate human resources manager of employment and recruitment, says that while ongoing research and development is critical, so too is the challenge of finding qualified individuals. With approximately 1,900 employees, the company plans to hire an additional 120 people for the research and development center, as well as regional offices in Vienna, VA; Little Falls, NJ; Boston; Atlanta; Irvine and San Francisco, CA. An e-recruiting tool at the Lawson Internet site assists potential candidates in matching up skills and criteria with current Lawson open positions. "About half the jobs are revenue generating and the other half are in research and development," says Laidlaw. "We need experience with JAVA, web development, object-oriented design, COBOL, and then various platforms, UNIX and NT, AS400."

Laidlaw looks on resumes for proof of accomplishment and career progression. "You'll work both as a single contributor

IT Careers in Software Engineering

and as a part of a team," explains Laidlaw. "Typically you will work on applications, developing new ideas for the product line.

"There are several reasons to choose Lawson," he adds. "We have turnover well below the industry average. You'll be able to take your ideas into the real world. We're probably the largest software player out there that is still privately held. And our 3,000 customers include the first client we ever sold software to."

Pitney Bowes Technology Center Shelton, CT

While Pitney Bowes manufactures and sells a number of business and consumer-based products, its Technology Center in Shelton is focused on engineering. Products developed here are sold as stand-alone applications and as web-based applications. The technology campus supports a number of businesses, including the mailing systems group, which offers postage and secure messaging, as well as shipping applications.

"We're working to provide customers with a variety of access points," explains Nanette Brown, director of software engineering for the mailing systems business. "Currently we're working on a suite of products that ranges from click messaging to click stamping and click shipping. In the future we'll see Internet connectivity for our traditional products, such as metering and mailing machines."

The Technology Center currently employs approximately 1,000 individuals. Positions are available for developers, architects, systems engineers and test engineers. "One of our major challenges is finding software engineers who also have good design, analysis and leadership skills," says Brown. "This is not just coding. We need diagnostic skills that are imperative to high quality software."

Brown says most people who work at Pitney Bowes give the team and technical environment as primary reasons for staying. "What most people say they like best is the community of people here. We place a lot of emphasis on working together as a team, having people be part of developing processes. Here you can be a part of something, shaping a product."

To assure that employees remain interested and continue to develop, Pitney Bowes moves people between different assignments. "We offer a training program, which we fund well, to enable this," Brown adds. "We want to offer some of those things that might entice a talented engineer to go elsewhere. We encourage engineers to help blaze the trail and solve problems."

SmartPipes Corporate Headquarters - Redwood City, CA Network Intelligence Center - Dublin, OH

The ability to build a successful business that can react quickly to market changes is tied directly to a company's network. SmartPipes' goal is to offer companies the

ability to control their network and take advantage of added communications services, all at significantly lower costs than current network solutions. "Today, most companies use frame relay and lease lines for site-to-site networks. They can move to the Internet for a less expensive, more reliable and secure service," explains Ken Jones, vice president of engineering. "SmartPipes provides advanced IP services such as secure intranets and extranets and interactive communications services that business customers can manage, from anywhere on the Internet, through a web-based graphical user interface (GUI)."

Dave Carlino, director of engineering, reiterates the point. "SmartPipes supplies an easy way to manage global IP services that normally would require 20 to 40 network engineers. We are solving a problem that has not been taken care of with software engineering – by building something entirely new."

Combining corporate networks with the public network will allow companies to extend still further, using application services and extranet business connections. "We are breaking new ground here, building a provisioning and monitoring system capable of monitoring and managing millions of edge devices," Jones says.

Currently, SmartPipes is building a tool kit for adding and supporting network devices, and will continue to grow by adding still more services. "We're creating a multi-tiered, DNA-based distributed web plant with a business logic tier already composed of more than three million lines of code," adds Mark Beadles, chief architect.

This is the kind of one-of-a-kind challenge that makes SmartPipes attractive as an employer. "A lot of developers can come into a company and write code," adds Carlino. "SmartPipes offers the opportunity to leverage your skills to solve a business problem, for the first time."

Unlike some startups, SmartPipes faces an excess of demand already. "We are a one-year-old company going after a multi-billion dollar marketplace that represents the next wave of Internet service users," Jones says. The business model involves a monthly fee from clients to secure a smooth cash flow.

"We're a team-oriented organization that allows people to apply their talents where they're best suited," adds Beadles.

XStream Logic, Inc. Los Gatos, CA

There's a hum in the IT industry concerning an all-new microprocessor that will enable more complex, high performance networks. At the creation end is XStream Logic, a rapidly growing, pre-IPO startup that is unlocking the potential of networking and storage equipment vendors to deliver intelligent packet processing and advanced networking services at very high data rates.

"We're building a network processor optimized to perform deep packet processing (networking layers 4-7) at data rates up to 10 Gbps. This allows our customers to deliver advanced services such as enhanced quality of service and billing applications that fundamentally change the nature of networking equipment," explains John Lynde, XStream Logic's director of software engineering. "Due to the programmable nature of our solution, we can be deployed across a wide range of equipment, such as core and edge routers, load balancing switches, storage devices and servers."

XStream Logic was incorporated in May 1998 and currently employs approximately 50 people. The company has plans to hire another 50-60 people within the next 12 months. "We need people in key areas of development tools, embedded operating systems, network software, and simulation/network testing," says Lynde. "We look at resumes for quality experience in these areas. Engineers with embedded software development experience, device driver and network stack implementation work, and engineers who are comfortable working with system kernel-level code are the ones we focus on.

"What attracts engineers to XStream Logic is our technology, our people, and our work environment. What we are doing in terms of hardware architecture is so leading edge that it has the entire industry excited," adds Lynde.

In particular, XStream Logic's advancements in networking and processor architectures unlock the ability of software engineers to create powerful solutions that can fundamentally change the capabilities of the networking infrastructure that defines the internet," he says. "At XStream Logic, you can work on truly innovative and new technology. You get to work with world-renowned computer scientists, and the people here are great. We have created a productive, fun, and supportive work environment."

Lynde notes that XStream Logic offers individuals the opportunity to grow and stretch, too. "You can come on board with expertise in one area and grow into another," he says. "Embedded software and networking is the place to be. Whether you're working on applications, systems, or tools, there is always something new and exciting to learn and work on in this space."

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For more job opportunities with Software Engineering firms, turn to the pages of ITcareers.

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EDITORIAL INDEX

3Com 41
A
Accord Networks 21
Activate 64
Akamai 64
Allied Telesyn 24
AT&T Broadband 33
AT&T 8, 33
B
BroadBand Office 38
BroadVision 47
C
Cisco 1, 17
Copper Mountain 41
Corio 50, 100
Covad 100
D
DealerKid 8
Dell 21
Digital Island 64
E
EMC 1
Entegrity Solutions 13
Entrada Networks 26
Equinix 41
Excite@Home 1
Extreme Networks 75
F
Foundry Networks 75
G
General Bandwidth 44
Genesys 24
H
Hewlett-Packard 21
Hitachi Data Systems 21
I
IBeam 64
IBM 10
Interland 47
IPlanet 10
M
Microsoft 1, 10, 27
Motive Communications 47
MyEZsales.com 102
Mynetsales.com 102
N
Network Appliance 1
NextWave Telecom 41
NorthPoint Communications .98
Novadigm 47
Novell 12, 30
NTT DoCoMo 8
P
Peregrine Systems 47
PictureTel 8
Q
Qwest Communications 41
R
RecoverySafe 50
Red Hat 21
Reynolds & Reynolds 8
Riverstone Networks 75
S
SBC Communications 33
Sniffer Technologies 8
Spectel 8
Sprint 41
Systar 47
T
Talk2 Technology 15
Tulip Computer International 21
V
VeriSign 10
Verizon 98
W
WebMethods 10
WorldCom 41
Y
Yahoo Broadcast 64
Yipes Communications 33

ADVERTISER INDEX

Advertiser	Page #	URL
3Com	18-19	www.3com.com
Adtran	104	www.adtran.com
AT & T	45	www.att.com
Avaya	22-23	www.avaya.com
Avocent	80	www.avocent.com
Bay Technical Associates	83	www.baytech.net
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BuyUptime.com	85	www.buyuptime.com
Cable & Wireless	6	www.cwas.net
Check Point OPSEC	9	www.opsec.com
Compaq Computer Corp	2-3, 11	www.compaq.com
Computer Associates	46	www.internetsolutions.ca.com
Dataprobe Inc	86	www.dataprobe.com
*Dell Computer Corp	33, 42-43	www.dell.com
Digital Image	86	www.dii-megachips.com
Dynarc, Inc	34-35	www.dynarc.com
eDial	13, 15, 17	www.eDial.com
Elron Software	97	www.internetmanager.com
Enterasys Networks	16	www.enterasys.com
Exabyte Corp	26-27	www.m2wins.com
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Infolibria Inc	25	www.infolibria.com
Intel Corp	31, 48-49	www.intel.com
Intermec	61	www.request.intermec.com
LinuxWorld	56	www.linuxworldexpo.com
Mitel Corp	54	www.mitel.com
Motorola	69, 71	www.motorola.com
Network Engines	55	www.networkengines.com
Network Ice	57	www.networkice.com
Network Instruments	82, 86	www.networkinstruments.com
Nokia Internet Communications	52-53	www.nokia.com
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Qwest Communications Int'l	28-29	www.qwest.com
Rackit Technology Co	83	www.RackitTechnology.com
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*Riversoft	73	www.riversoft.com
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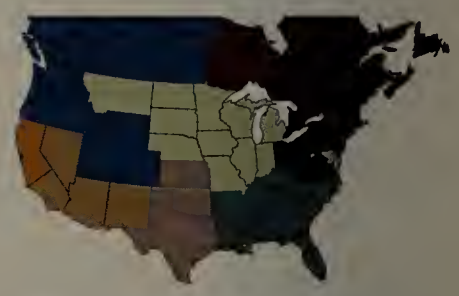

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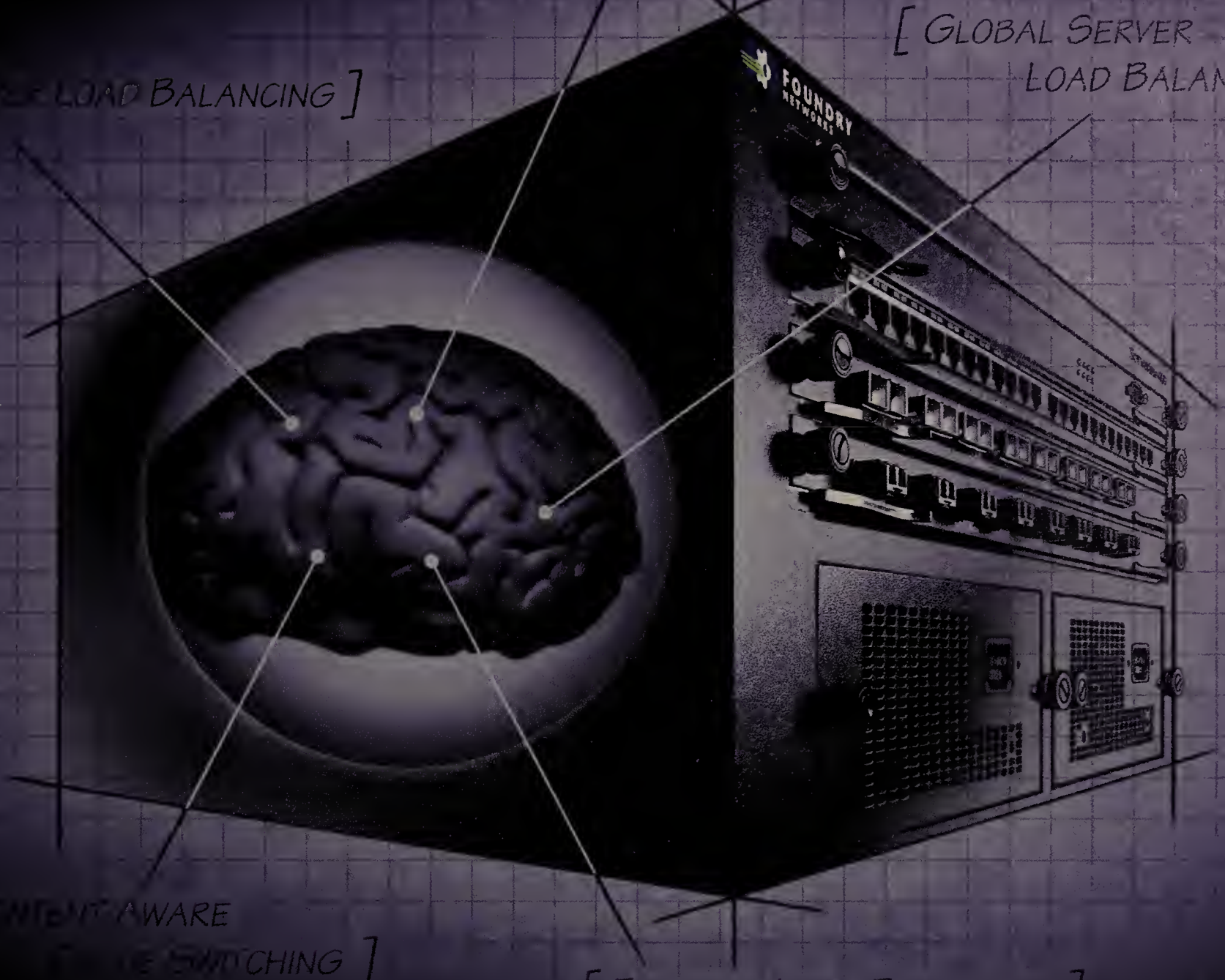

HOW INTELLIGENT LOAD BALANCING LOOKS INSIDE.

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FOUNDRY NETWORKS

Cisco,
continued from page 1

users of the PIX Firewall. What the PIX 535 gives you is speed. As data centers and campus networks jump to 300M bit/sec and 450M bit/sec connections in 2001, the corporate firewall will have fallen far behind. The PIX 535 is one of two firewalls we've tested that can truly handle these gigabit speeds. NetScreen's NetScreen 1000 also handles this level of throughput.

Although the PIX 535 shares the same cumbersome, counterintuitive command-line interface with the rest of the PIX family, it breaks loose with impressive performance. Start with the hardware. It's small: 3U (5.25 inches high) is all it takes to firewall off a gigabit of traffic. The PIX 535 has a highly maintainable chassis with dual hot-swap power supplies and nine expansion slots. We swapped cards during our tests, and Cisco has made this easy. It's not quite as accessible as Cisco's 7000 series routers, but you can get to the important parts of the PIX — including the CPU board and all expansion cards — in about 30 seconds.

More important than those nine expansion slots is the hardware sitting behind them: three PCI buses, two of which are 64 bits wide to accommodate the four Gigabit Ethernet interfaces Cisco expects you'll use to connect your PIX 535 to your network. The third PCI bus is a 32-bit bus, which can take four 10/100 Ethernet interfaces and a VPN accelerator card. Driving those buses is a 1-GHz Intel processor (the box is dual-CPU capable, but dual CPUs are not currently supported) and a gigabyte of memory. Everything about this box says "gigabit" — memory, CPU and LAN. Total it up, and you can have up to four Gigabit Ethernet and four 10/100M bit/sec Fast Ethernet interfaces in this system. That's serious bandwidth.

In our most optimistic and easiest test — simulating four huge connections using a Spirent SmartBits 6000 with large packets — the PIX 535 turned in an amazing 2,080M bit/sec performance. That's almost six times faster than the PIX 525, Cisco's closest model, is rated by the company. Of course, you won't see that kind of performance in real-life situations. Our benchmarks show that normal Internet traffic with 2,000 connections through the firewall could expect a steady performance of 400M bit/sec.

Connection establishment also doesn't seem to slow the PIX 535 (see graphic, below). We benchmarked it at approximately 8,500 connection/sec, up to 1.2 million simultaneous connections. That's a ridiculously huge number of connections, and Cisco engineers told us it could go as high as two million, but that's more than we could test in our lab.

At more reasonable connection rates, the PIX 535 hums along nicely. We used Antara's Flamethrower to run a constant stream of 500 connection/sec through the PIX 535 and saw only a few percentage points drop in performance. When we put the Flamethrower into denial-of-service attack mode, the effect was a little more pronounced, with about a 20% drop in throughput.

The PIX 535 has an optional encryption acceleration card (based on IRE's SafeNet DSP), which we benchmarked at speeds of 90M bit/sec using a fairly typical traffic mix and a small number of IP Security associations. This compares favorably with midrange VPN devices from Nokia, Alcatel and NetScreen, which typically hover just below the 100M bit/sec mark in Triple-DES/SHA-1 encrypting throughput (see graphic, right). The PIX 535 accelerator card does substantially better than normal PCI-based encryption devices we've seen, largely because of bus contention issues. Cisco's engineering and three-bus architecture give a performance boost that normal PC-based firewalls can't compete with.

We learned from our tests that the PIX 535 is very sensitive to configuration and network engineering. For example, our initial encryption tests were done with the VPN accelerator on the same PCI bus as the Fast Ethernet cards we were using for part of the test. PCI buses form a horrible bottleneck in general, and we saw performance drop by as much as 30% in some tests. When we balanced traffic more carefully by spreading it across the three PCI buses, performance improved dramatically. We saw less dramatic results as we balanced traffic across interfaces and buses in our testing, typically in the 10% or lower range.

Final analysis

Is the PIX 535 for you? If you need Gigabit Ethernet performance, you don't have a lot of choices. NetScreen's NetScreen 1000 offers similar speeds when fully configured, but at nearly twice the price of the $95,000 fully configured PIX 535. At speeds that high, though, either may seem a bargain.

The PIX's biggest deficiency is its command-line interface. Similar to Cisco's IOS, the PIX is just different enough to give any IOS expert a headache.

The PIX remains a firewall for companies and application service providers that can live with a small set of firewall rules and don't ask for a lot of flexibility in their security appliances.

While some security experts dismiss the lack of features in the PIX, others find it a solid product, citing the simplicity mantra: Simpler systems are easier to understand and secure, and the PIX is nothing if

See **Cisco**, page 98

NetResults

Cisco Secure PIX 535

URL: www.cisco.com **PRICING:** $75,000 to $95,000, depending on configuration. **PROS:** Superhigh performance, high connection rate, high open connection count and good encryption speed. **CONS:** Missing some firewall features, difficult to configure, flexibility in security policy is limited.

REVIEW Exclusive

Speedy encryption

Our tests showed that the optional encryption acceleration card that ships with the PIX 535 compares favorably with those included with midrange VPN devices from Nokia, Alcatel and NetScreen.

PIX 535	Encryption tests	Performance (less than 0.1% loss)
	Small packets (64 octets)	18M bit/sec throughput
	Large packets (1,400 octets)	108M bit/sec throughput
	Half small packets/half large packets	90M bit/sec throughput

Making the gigabit connection

Our tests showed that the Cisco Secure PIX 535 can adequately handle a range of packet combinations at throughput speeds ranging from 360M to 2,080M bit/sec.

PIX 535	Performance	Performance (less than 0.1% loss)
	4 connections, 1,518-octet packets	2,080M bit/sec throughput
	2,000 connections, "normal" traffic mix	440M bit/sec throughput
	2,000 connections, "normal" traffic mix, 500 connection/sec	400M bit/sec throughput
	2,000 connections, "normal" traffic mix, plus denial-of-service attack	360M bit/sec throughput

Note: Your traffic mix affects performance heavily. Many small packets cause a real problem; many big packets are easy to handle. The largest possible Ethernet packet has 1,518 octets, so 1,518 octets are going to give you the best possible performance.

How We Did It

Generating traffic for a Gigabit Ethernet firewall is no simple task, so we turned to Spirent for a SmartBits 6000 with four Gigabit Ethernet interfaces. We connected these back-to-back with the PIX 535 to get raw throughput numbers. For our typical traffic profile, we used data collected from an Internet backbone to build a profile of approximately 50% small packets (96 octets or less); 10% large packets (1,518 octets, the Ethernet multitenant unit); 20% 576 octets (a common WAN MTU); and 20% assorted between 192 and 1,024 octets. We set up 2,000 sessions using Spirent's SmartFlow through the PIX 535 using User Datagram Protocol as the transport protocol and measured loss rates. When loss went above 0.1%, we decided the PIX had run out of steam and took the next lower bandwidth measure as total throughput capability. We also used Spirent's SmartTCP software to test connection establishment rates.

To put additional stress on the PIX 535, we used Antara's Flamethrower to generate TCP connections and HTTP traffic.

Flamethrower could bring up and take down about 500 connections per second, simulating a moderate-sized Web server. We also used Flamethrower's denial-of-service attack mode to see how the PIX 535 would behave when bad guys are out there.

For VPN testing, we used Alcatel 7137 SVG systems to encrypt/decrypt IP Security Triple-DES traffic to the PIX 535. These systems have been benchmarked in our labs in excess of 80M bit/sec, so we used multiple systems to safely exceed the rated speed of the IRE/SafeNet acceleration board in the PIX 535. In this we used a Spirent SmartBits 2000 to generate over multiple 100M bit/sec Fast Ethernet interfaces, with an Extreme Networks' Summit 48i switch to combine the streams into Gigabit Ethernet on one side of the PIX 535. To balance the traffic across the three PCI busses, we put Gigabit Ethernet on one bus, Fast Ethernet interfaces on another, and the accelerator card on the third.

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Verizon leaves NorthPoint at the altar

BY MICHAEL MARTIN

NEW YORK — Verizon last week ended its merger agreement with DSL provider NorthPoint Communications, citing NorthPoint's deteriorating financial position and business operations as primary causes.

NorthPoint and Verizon announced Aug. 7 that Verizon would purchase a 55% interest in NorthPoint and that the firms would merge DSL operations.

Early last month, NorthPoint had restated its third-quarter earnings downwards to reflect that some of its service provider customers would be unable to pay for NorthPoint's services.

NorthPoint's shares closed at 59 cents on Thursday, down from the stock's 52-week high of $34.75 recorded in January.

NorthPoint President and CEO Liz Fetter says she was "stunned" by Verizon's move.

Fetter says NorthPoint is looking at its funding options and considering legal action.

Adam Guglielmo, an analyst with telecommunications consultancy TeleChoice, notes that capital markets are not in a very giving mood right now, and that NorthPoint already carries significant debt. "They are in trouble," he says.

But he adds that NorthPoint's problems shouldn't be too much of a concern for the company's customers.

"If NorthPoint goes, someone will continue to serve them," he says.

Verizon had hoped to use its merger with NorthPoint to help fulfill its out-of-region expansion plans. When GTE and Bell Atlantic merged to form Verizon, the companies agreed to expand beyond their core East Coast territories.

Verizon says it will fulfill its out-of-region obligations through its merger with OnePoint Communications, a competitive local exchange carrier and interexchange carrier serving the residential market, and its relationship with Metromedia Fiber Networks.

NorthPoint: www.northpointcom.com; Verizon: www.verizon.com

Cisco,
continued from page 96

not simple.

It's also got some nice seasoning on it, with more than five years of predecessors in the PIX line under its belt. Although we were officially running very late beta-test version software, it exhibited traditional Cisco stability and gave us crash-free performance. If you've got an easy-to-express policy and a bunch of bandwidth, the PIX 535 is an incredibly fast performer in a nice package.

Snyder is a senior partner at Opus One, in Tucson, Ariz., specializing in messaging and security. He can be reached at joel.snyder@opus1.com.

Snyder is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

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EMC,
continued from page 1

NAS sales vs. EMC's 29% market share, according to preliminary figures from market research firm IDC. But Enterprise Storage Group, another market watcher, estimates EMC will match Network Appliance in units shipped in 12 months thanks in large part to the ip4700 hitting the market.

"EMC has a big winner with this box," says Robert Gray, an analyst with IDC. "Where EMC is playing, they are coming in at NetApps' high end. EMC has 10 people in the field for every one that Network Appliance has — that virtually guarantees success for [EMC]."

The ip4700 performs the same as the NetApp F840, sources say. And there's every chance that EMC will undercut Network Appliance on price to gain market share. "EMC is not going to come in and lose business on price," Gray says.

The NetApp F840 moves data at about 1G bit/sec and can perform more than 25,000 operations per second. It starts at $120,000. The F840c, which is a two-node cluster with one-half terabyte of disk space, costs $319,000.

"The ip4700 is a killer box because it has the capability of a two-node NetApps cluster," says Steve Duplessie, an analyst with Enterprise Storage Group.

"The difference is that the ip4700 is tightly integrated and costs half what the NetApp cluster does. Network Appliance should be running scared — EMC finally has a product that can do battle with them," he adds.

About 100 EMC customers beta tested the ip4700 and those *Network World* spoke to liked what they saw.

"We have looked at the ip4700 as a replacement for our NetWare and Windows NT file and print services," says Gary Fox, a vice president at Union Bank in Charlotte, N.C. "Before we move to NAS, however, our IT staff wants to validate the security of the devices [running the Microsoft Common Internet File System] to make sure that access to files and directories can be defined exclusively by the user. Once we've done that, it's possible that we will put one in."

> ***"Network Appliance should be running scared — EMC finally has a product that can do battle with them."***
>
> Steve Duplessie, analyst, Enterprise Storage Group

Union Bank already supports database traffic on a Fibre Channel-based storage-area network (SAN) consisting of McData switches, EMC Symmetrix arrays and Unix hosts.

The ip4700 draws on Clariion NAS technology obtained through the acquisition of Data General last year and an embedded operating system obtained via EMC's recent buyout of CrosStor.

The ip4700 has dual processors and controllers that can step in for the other in the event of a failure. One processor contains the CrosStor operating system for file sharing; the other has RAID 5 capability and handles traditional block data processing. The ip4700 has redundant power supplies and fans.

Unlike the NetApp F840, the ip4700 does not support HTTP or the Direct Access File System (DAFS) standard. DAFS is a successor to Unix's Network File System, which bypasses the operating system and increases data transfer speed by writing directly into the memory of an application. The ip4700 supports SNAPview/IP, EMC's snapshot back-up software, and will support remote data replication in the future. The ip4700 also supports the Network Data Management Protocol, a data back-up standard for removing traffic from the network.

EMC's sales of the ip4700 have little, if any, chance of cannibalizing sales of its high-end Celerra NAS or Symmetrix storage array, says Dave Hill, an analyst with Aberdeen Group. Those existing products are generally used by large companies for different applications, such as databases and data warehouses.

"EMC's entry into the midrange gives the company an opportunity in a new market," Hill says. "The effect is that EMC will be a formidable competitor and give NetApps a good contest."

The midrange market is part of EMC's vision of NAS/SAN convergence, says Chuck Hollis, a product marketing executive with EMC. "Guys that put in high-end Celerra or Symmetrix devices want to consolidate data into a single enterprise environment. For every one of those businesses, there are ones that either can't or don't want to [consolidate storage] — they want to manage that data with NAS devices, which may be scattered around their networks in smaller chunks."

Network Appliance officials are claiming to be unfazed by the new EMC offering.

"From a product point of view, we compete head-on with the Symmetrix," EMC's top-of-the-line enterprise storage system, says Thomas Mendoza, president of Network Appliance. "We win at least 60% of our bids against Symmetrix. A year ago, EMC said the Celerra was going to be its big NAS play. It did nothing to us."

"EMC is coming out with a product based on a Data General Clariion with a CrosStor file system," Mendoza says. "If EMC's name was not on this product, it [wouldn't have a chance]."

EMC's ip4700 contains a 10/100/1000M bit/sec Ethernet interface and supports up to 100 drives. Initially, 3.6-terabyte appliances will ship, but the EMC boxes will include drives with double the capacity down the road. EMC will add a Fibre Channel interface in the future.

The NetApp F840, using the Data OnTap 6.0 operating system, has a 10/100/1000M bit/sec Ethernet interface to the LAN and a Fibre Channel interface to the SAN.

EMC: www.emc.com

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ASP,
continued from page 1

ASP customers.

Excite and @Home merged in May 1999. One month after the union, Mary Ruiz, director of human resources technology and operations, joined Excite@Home with the goal of developing a common process to combine and support the separate financial and human resources operations of the joined company.

Turning to an ASP was an easier choice for Ruiz and her team because Excite was already working with ASP Corio, but that doesn't mean it was a slam-dunk. The company also explored using Oracle financials in-house.

The company does not expect to save a bundle through using ASPs; Ruiz is actually not counting on any cost savings. The decision has more to do with risk management than saving money.

"We are operating under the premise that we are reducing risk by shifting it to an ASP that's tied to a stringent contract," she says. "We would rather have total cost of ownership tied to a contract that we know we cannot deliver internally."

Corio guarantees 99% application availability, which would have been difficult to support internally, especially when Excite@Home first merged.

Instead of focusing on buying hardware, maintaining multiple application servers and hiring staff to get a companywide PeopleSoft financials package up and running, Ruiz focused on how to make that application work best for Excite@Home.

Corio had a leg up on landing the five-year contract with Excite@Home because the two companies share a few venture capitalist board members, Ruiz says. Despite that influence, Ruiz says the relationship would have ended if the Corio service was not up to par.

"We didn't have to stay," she says. "Corio's performance has been great, and we had a lot of out clauses that we could have used if we weren't satisfied."

And satisfied Excite@Home is. Since inking its PeopleSoft financials deal, Excite@Home has signed a separate three-year deal with Corio for a PeopleSoft human resources application. More than 150 employees access the applications through a local dedicated T-1 line from the company's headquarters directly to Corio's data center.

Excite@Home is also working with Icarian and Kadira, two vertical-market ASPs that address special niches within the company, Ruiz says.

Icarian offers a workforce planning and management application, and Kadira offers applications that augment the company's transaction engine, she says. Both applications are accessed through a second dedicated local T-1.

While outsourcing some of its most cumbersome applications let Excite@Home's IT staff focus on internal transitions, the company hit some bumps in the road as it was bringing the Corio applications online.

"If we could go back and start over again, we would go in with someone [from Excite@Home] dedicated to business continuity," Ruiz says. "We assumed that Corio would have business expertise and process expertise in-house, and what they came in with at that time were vanilla apps."

Excite@Home quickly realized that out-of-the-box PeopleSoft was not going to work, and started outlining software customization that would be required. "We needed [customization] desperately," Ruiz says. "We are still recovering from not doing that right as a company, although we're now getting better."

Arthur Andersen was hired to customize the financial application, while Excite@Home's internal experts tailored the human resources application.

The company is contemplating signing another deal with Corio for its Siebel customer resource management application hosting service. If that happens, Ruiz says Excite@Home will start with Siebel software consultants from Day 1.

When the ASP market began heating up more than a year ago, most providers touted standard applications with little or no customization. Today, more ASPs are allowing customization because it's what large businesses need and demand. But ensuring the application will meet a user's needs is only one step, Ruiz says; knowing that the application is securely stored and managed is also important.

Before users sign on the dotted line, Ruiz says they should know what's going on at their ASP's data center. The data center adds another level of complexity where latency and other performance issues can crop up, she says.

"We knew we did not want to team with an ASP that owned its own data centers, because we wanted the ASP to be nimble enough to negotiate the best contracts," she says.

Corio buys collocation space from Web hosting service providers XO Communications' Concentric Network and Exodus Communications.

"We also wanted to know what type of contracts our ASP had with its partners, so we requested to see those documents," Ruiz says, adding that the request met with initial resistance. "But we told [Corio] that it's a condition of our business."

Users also need to keep an eye out for hidden costs, Ruiz says. Excite@Home is paying for its services based on the number of users who access the application. But there are often setup fees, consulting fees if customization is needed, and change fees, she says. Some ASPs charge customers each time they need to update a customer's application server.

"Working with ASPs is part of our DNA," Ruiz says. "I've negotiated three ASP deals since being on board and worked through three different implementations. We've learned a lot of lessons during that time."

Next week hear how start-up Intraware got its salesforce up and running quickly by going with an ASP. ◪

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Excite@Home's ASP access methodology

Users in more than a dozen Excite@Home offices in the U.S. access Corio-hosted PeopleSoft financial and human resources applications through the company's frame relay network.

1. Remote users' requests travel over the WAN into a FRAD at Excite@Home's headquarters.
2. The traffic is then sent through the company's firewall server and access router before it's sent over a dedicated T-1 line from Pacific Bell.
3. The T-1 connects directly to Corio's data center.

Covad announces layoff of 400 workers

BY MICHAEL MARTIN

SANTA CLARA — Covad Communications announced last week that it will lay off almost 400 employees, which represents 13% of the company's workforce.

The DSL provider is also holding off on expansion of its national network to more than 2,000 central offices, covering about 45% to 50% of the U.S. market. The company says the reason for the expansion halt is that it expects to gain more business in the regions where it already operates. That increase is a result of the roll-out of line sharing technology.

Covad says the workforce reductions should let the company cut its costs by between 20% and 30% in 2001.

The announced cuts come on the heels of a disappointing third-quarter financial report in October. The company attributed its poorer-than-expected performance to the fact that nine of its ISP reseller partners were unable to pay fees owed to Covad. The company's CEO Robert Knowling resigned shortly after the delivery of the bad news.

Earlier the firm lowered its third-quarter reported revenue and added five more ISPs to the list of resellers that say they are unable to pay Covad.

Covad: www.covad.com

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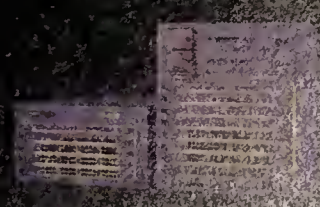

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Backspin

Hacking the cuteness out of Furby

ute is something that should be firmly stamped out with unremitting savagery. Perhaps the definitive and best-known example of cute is the appalling song that accompanies that most horrific of "entertainment" rides at Disneyland. Of course I refer to "It's a Small World."

The ride is disgustingly cute but is eclipsed by its accompanying song. Just 30 seconds of that nonstop, saccharine ditty is enough to have me grinding my teeth and cursing Robert and Richard Sherman — Academy Award-winning composers — who penned the song in 1966.

Which all leads nicely into this week's topic: Furby.

Furby, for those of you who have managed to avoid it by dint of not being parents of young children, not watching popular television and never going into any toy shops, is a robot doll. It is a marvel of engineering, and it retails for as little as $20.

MARK GIBBS

Anyway, this robot (and it really is a robot, not just an animated toy) not only moves its mouth, its ears and its eyes (although the device doesn't move from wherever you put it), it also bounces in place. Add to that sensing the light level, being tilted or anything touching its mouth, belly or back, as well as audio input and infrared sending and receiving (for communications between Furbys!) along with sound generation, and you have a pretty amazing package (check out the Furby autopsy at www.phobe.com/furby/).

Cute enters the picture as, true to its name, the thing is covered in hideous synthetic fur and it babbles in a grating, sing-song "language" that the manufacturer, Tiger Electronics (part of Hasbro), is pleased to call "Furbish" — see the remarkable LangMaker site at www.langmaker.com/furbish.htm for much more than you might expect on Furbish in particular, and invented languages in general.

In January 1999, Peter van der Linden, an engineer in Silicon Valley, issued the "Hack Furby" challenge (see www.afucom/fur.html) — a challenge to make Furby reprogrammable — with a prize of $250. Needless to say, the winner wasn't going to retire on the basis of the prize, but that didn't stop Jeffrey Gibbons, a Canadian computer consultant, from trying.

Of course as you might imagine, hacking Furby doesn't exactly delight the toy's creator Dave Hampton or Tiger. The last thing they wanted was a "potty-mouthed" Furby (something that was easily done to Microsoft's Barney robot toy).

Gibbons' solution (see www.afucom/furby/winner.html and www.furbyupgrade.20m.com/) was not to actually get inside the Furby electronics — a rather difficult task, as they are custom chips encased in epoxy -- but to produce replacement circuit boards to substitute those inside Furby.

Voila! A programmable Furby with an RS-232 interface, much enhanced IR communications and all code that will be eventually open source. You can buy the upgrade kit (http://canada-shops.com/stores/furbyupgrade/) or at least you can try — at the moment its payment system is down, and it suggests you use PayPal (www.paypal.com). I tried to use PayPal, but I will now be sending Gibbons and Co. a check . . . and I bet you can guess what next week's topic is.

Be that as it may, it turns out that the Furby Hackers have loftier goals. They plan to create an operating system for Furby based on Philos (a freeware multitasking kernel that I cannot find anything about) that they refer to as FurbOS.

Of course, Tiger may yet take them to court, although as Gibbons et al. point out, to modify a Furby you have to buy a Furby. Plus there is a potential public relations windfall here for the product — see the story about the autistic child at www.afu.com/ furby/winner.html.

So I'm off now to send a check for my upgrade kit so I can hack my son's Furby. You can bet that when I'm finished, there'll be nothing cute about it.

Noncute comments to mw column@gibbs.com.

'NET BUZZ

The latest on the Internet industry

PAUL MCNAMARA

Selling something through an auction service such as those on **eBay**, **Yahoo** or **Amazon** seems simple enough . . . unless you don't want to buy a digital camera, are nervous about transacting business with strangers, or don't have time to be fielding e-mail inquiries and wrapping packages for shipment.

Enter **myEZsales.com**, a Boston start-up whose founder, **Don Larson**, sees money to be made helping those who want to play the online auction game but don't have the wherewithal or patience. The company recently landed $7.6 million in a second round of funding led by JAFCO Ventures, General Catalyst and I-Group HotBank.

Here's how myEZsales works:

Instead of heading online, the reluctant auctioneer puts the item he wants to sell into his car and heads for a local package-shipping store that is affiliated with myEZsales. There he fills out a form that describes the item and sets a minimum acceptable auction price (Larson says the service is best suited for merchandise that's likely to fetch at least $75, meaning this isn't the best way to get rid of unwanted CDs).

The store does the rest: taking the digital photo, posting and monitoring the auction on whichever site the seller designates, handling the financial transaction, and wrapping and shipping the item to the buyer.

Cost to the seller: a reasonable $6 listing fee and 6% of the sale.

The shipping stores love the idea, Larson says, because the service increases their package volumes and gives their employees productive work to do during their off-peak hours of midmorning and midafternoon.

The myEZsales service is only available in parts of Massachusetts, Connecticut, Colorado and New Hampshire, although Larson says he has aggressive expansion plans.

Buzz likes this idea, in part because of a personal experience. Before moving into a new house not long ago, I considered trying to unload a bunch of never-used stuff on eBay, but abandoned the notion after getting a look at what such an effort entails. OK, call me lazy.

Would I have driven that stuff to a shipping outlet and filled out a form to get it auctioned off?

You bet.

MyEZsales.com might want to take a cue from the similar-sounding mynetsales.com . . . and ditch the lame name.

Purveyors of Web-based sales management applications, the folks at **mynetsales.com** awoke one morning and realized they needed a more dignified moniker if their company was going to be considered all grown up. They set about the task of finding an acceptable alternative, only to discover — as have so many before them — that all the decent domain names are tied up by other e-businesses and speculators.

Then they got incredibly lucky.

A traveler walking through an airport spotted an ad for mynetsales — the company's first marketing campaign — and realized immediately that he was the owner of a domain name this company might want: **Salesnet.com**.

A phone call, a bit of negotiation and a check for "less than five figures" spelled the end of the mynetsales brand.

Several of us here received a press release last week from a wireless service provider — not a household name, but one you may have heard of or read about. (Sorry, but I'm not naming the company, because the type of nonsense it's selling shouldn't be rewarded with free publicity.)

The service is called Bathroom Finder, and promises to solve the problem of our not being able to locate a public toilet when nature calls. How? By providing a potty-spotter Web portal for PDAs.

Want to bet this service is circling the drain inside of six months?

Feel free to tell me to lighten up. The address is buzz@nww.com.

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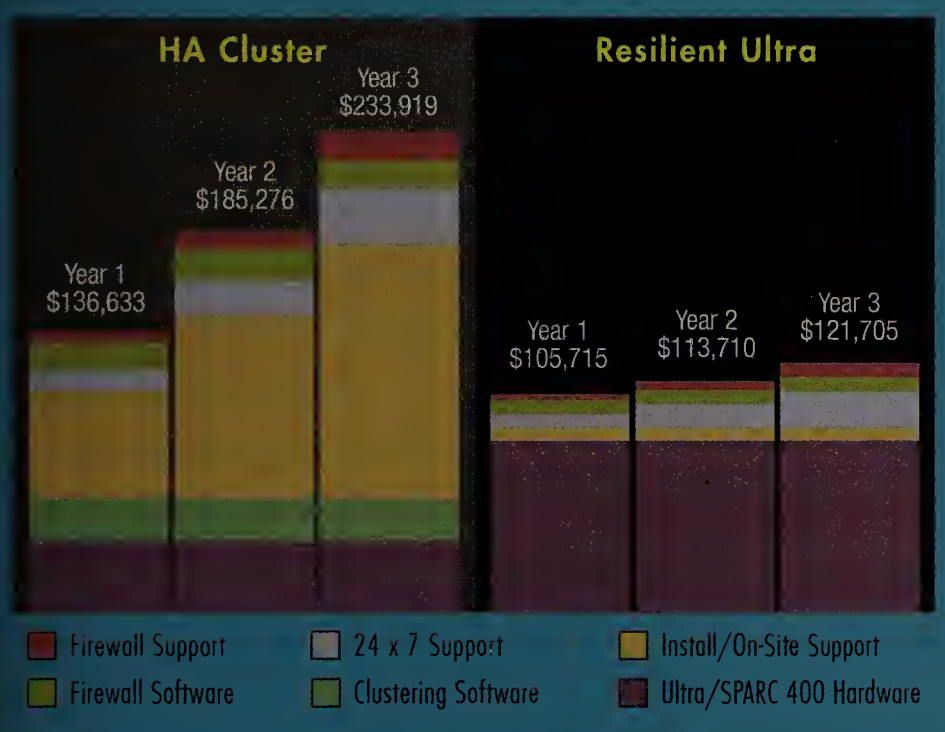

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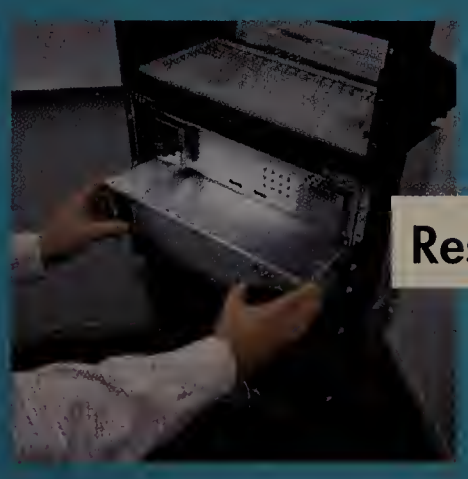

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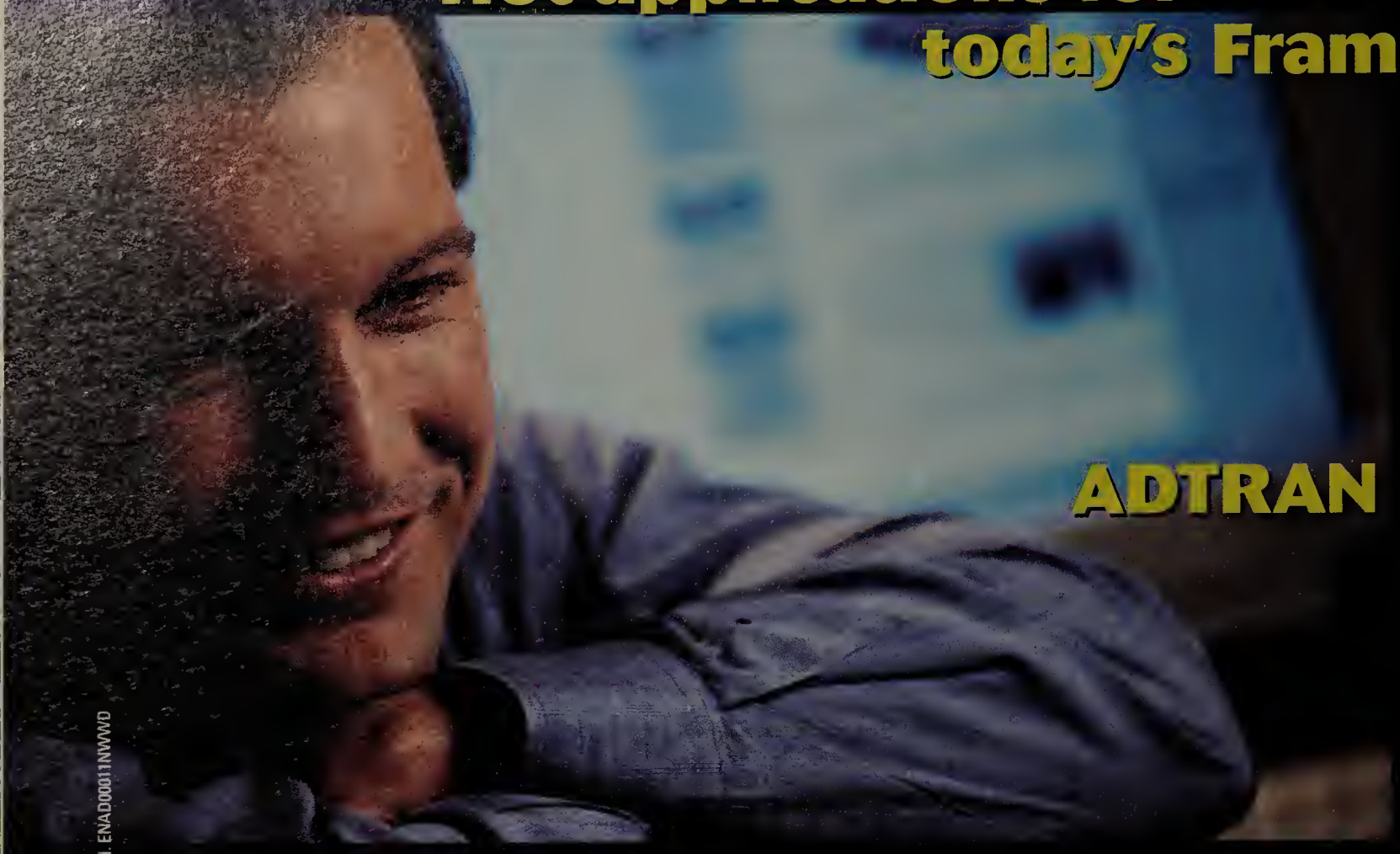

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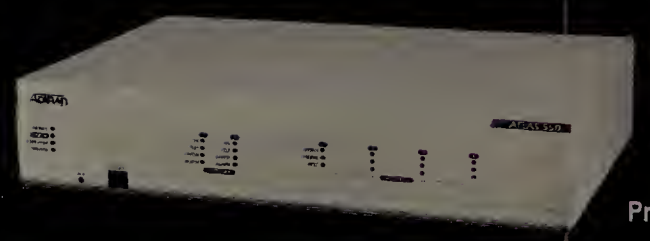

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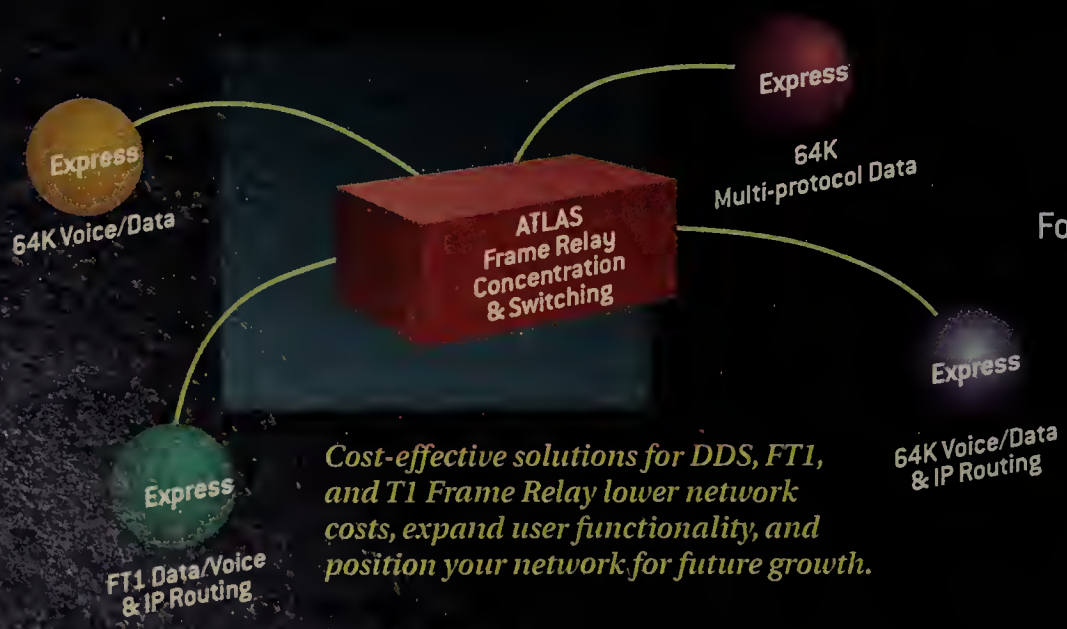

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